MEDICAL REPOSITORY,

FOR

AUGUST, SEPTEMBER AND OCTOBER, 1803.

ARTICLE I.

An ACCOUNT *of the* EXAMINATION *of the* BODY *of a little* BOY *who died of the* HYDROPHOBIA; *intended to show the probable Success of Dr.* PHYSICK'*s Proposal for preventing Death by making an artificial opening into the Windpipe. By* BENJAMIN RUSH, *M. D. Professor of Medicine in the University of Pennsylvania: in a Letter to Dr.* EDWARD MILLER.

DEAR SIR,

IN the first number of the fifth volume of your Repository, Dr. Physick has supposed death from Hydrophobia to be the effect of a sudden and spasmodic constriction of the glottis, inducing suffocation, and that it might be prevented by creating an artificial passage for air into the lungs, whereby life might be continued long enough to admit of the disease being cured by other remedies. The following account of a dissection is intended to show the probability of the Doctor's proposal being attended with success.

On the 13th of September, 1802, I was called, with Dr. Physick, to visit, in consultation with Dr. Griffitts, the son of William Todd, Esq. aged five years, who was ill with the disease called Hydrophobia, brought on by the bite of a mad dog, on the 6th of the preceding month. The wound was small, and on his cheek, near his mouth—two circumstances which are said at all times to increase the danger of wounds from rabid animals. From the time he was bitten he used the cold bath daily, and took the infusion, powder and seeds of the Anagallis, in succession, until the 9th of September, when he was seized with a fever which at first resembled the remittent of the season. Bleeding, purging, blisters, and the warm bath were prescribed for him, but without success.

The last named remedy appeared to afford him some relief, which he manifested by paddling and playing in the water. At the time I saw him he was much agitated—had frequent twitchings—laughed often; but with this uncommon excitement in his muscles and nerves, his mind was unusually correct in all its operations.

He discovered no dread of water, except in one instance, when he turned from it with horror. He swallowed occasionally about a spoonful of it at a time, holding the cup in his own hand, as if to prevent too great a quantity being poured at once into his throat. The quick manner of his swallowing, and the intervals between each time of doing so, were such as we sometimes observe in persons in the act of dying of acute diseases. Immediately after swallowing water, he looked pale, and panted for breath. He spoke rapidly, and with much difficulty. This was more remarkably the case when he attempted to pronounce the words *carriage*, *water*, and *river*. After speaking he panted for breath in the same manner that he did after drinking. He coughed and breathed as patients do in the moderate grade of the Cynanche trachealis. The dog that had bitten him, Mr. Todd informed me, made a similar noise in attempting to bark a day or two before he was killed. We proposed making an opening into his windpipe. To this his parents readily consented; but while we were preparing for the operation, such a change for the worse took place, that we concluded not to perform it. A cold sweat, with a feeble and quick pulse, came on; and he died suddenly, at 12 o'clock at night, about six hours after I first saw him. He retained his reason, and a playful humour, till the last minute of his life. An instance of the latter appeared in his throwing his handkerchief at his father just before he expired. The parents consented to our united request to examine his body. Dr. Griffitts being obliged to go into the country, and Dr. Physick being indisposed, I undertook this business the next morning; and, in the presence of Dr. John Dorsey, (to whom I gave the dissecting knife) and my pupil Mr. Murduck, I discovered the following appearances. All the muscles of the neck had a livid colour, such as we sometimes observe, after death, in persons who have died of the sore-throat. The muscles employed in deglutition and speech were suffused with blood. The epiglottis was inflamed, and the glottis so thickened and contracted as barely to admit a probe of the common size. The trachea below it was likewise inflamed and thickened, and contained a quantity of mu-

cus in it, such as we observe now and then, after death, from Cynanche trachealis. The œsophagus exhibited no marks of disease; but the stomach had several inflamed spots upon it, and contained a matter of a brown appearance, and which emitted an offensive odour.

From the history of this dissection, and of many others in which much fewer marks appeared of violent disease in parts whose actions are essential to life, it is highly probable death is not induced in the ordinary manner in which malignant fevers produce it, but by a sudden or gradual suffocation. It is the temporary closure of this aperture which produces the dread of swallowing liquids: hence the reason why they are swallowed suddenly, and with intervals, in the manner that has been described; for, should the glottis be closed during the time of two swallows, in the highly inflamed state of the system which takes place in this disease, suffocation would be the immediate and certain consequence. The same difficulty and danger attend the swallowing saliva, and hence the symptom of spitting, which has been so often taken notice of in Hydrophobia. Solids are swallowed more easily than fluids, only because they descend by intervals, and because a less closure of the glottis is sufficient to favour their passage into the stomach. This remark is confirmed by the frequent occurrence of death in the very act of swallowing, and that too with the common symptoms of suffocation. To account for death from this cause, and in the manner that has been described, it will be necessary to recollect, that fresh air is more necessary to the action of the lungs in a fever than in health, and much more so in a fever of a malignant character, such as the Hydrophobia appears to be, than in fevers of a milder nature. An aversion from swallowing liquids is not peculiar to this disease. It occurs occasionally in the Yellow fever. It occurs likewise in the disease which has prevailed among the cats both in Europe and America, and probably in both instances from a dread of suffocation in consequence of the closure of the glottis, and sudden abstraction of fresh air.

The seat of the disease, and the cause of death, being, I hope, thus ascertained, the means of preventing death come next under our consideration. Tonic remedies, in all their forms, have been administered to no purpose. The theory of the disease would lead us to expect a remedy for it in blood-letting. But this, though now and then used with success, is not its cure; owing, as we now see, to the mortal seat of the

disease being so far removed from the circulation as not to be affected by the loss of blood in the most liberal quantity. As well might we expect the inflammation and pain of a paronychia, or what is called a felon on the finger, to be removed by the same remedy. Purging and sweating, though occasionally successful, have failed in many instances; and even a salivation, when excited, (which is rarely the case) has not cured it. An artificial aperture into the windpipe alone bids fair to arrest its tendency to death, by removing the symptom which generally induces it, and thereby giving time for other remedies, which have hitherto been unsuccessful, to produce their usual salutary effects in similar diseases.* In removing faintness, in drawing off the water in ischuria, in composing convulsions, and in stopping hæmorrhages in malignant fever, we do not cure the disease, but we prevent death, and thereby gain time for the use of the remedies which are proper to cure it. Laryngotomy, according to Fourcroy's advice, in diseases of the throat which obstruct respiration, should be preferred to tracheotomy, and the incision should be made in the triangular space between the thyroid and cricoid cartilages. Should this operation be adopted in order to save life, it will not offer near so much violence to humanity as many other operations. We cut through a large mass of flesh into the bladder in extracting a stone. We cut into the cavity of the thorax in the operation for the empyema. We perforate the bones of the head in trepanning; and we cut through the uterus, in performing the Cæsarian operation, in order to save life. The operation of laryngotomy is much less painful and dangerous than any of them; and besides permitting the patient to breathe and to swallow, it is calculated to serve the inferior purpose of lessening the disease of the glottis by means of local depletion. After an aperture has been thus made through the larynx, the remedies should be such as are indicated by the state of the system, particularly by the state of the pulse. In hot climates it is, I believe, generally a disease of feeble re-action, and requires tonic remedies; but in the middle and northern States of America it is more commonly attended with so much activity and excitement of the blood-vessels, as to require copious blood-letting and other depleting remedies.

* The hoarse barking, or the total inability of mad dogs to bark, favours still further the idea that the mortal seat of the disease is in the glottis, and that the remedy which has been proposed is a rational one.

Should this new mode of attacking this furious disease be adopted, and become generally successful, the discovery will place the ingenious gentleman who suggested it in the first rank of the medical benefactors of mankind.

Before I conclude my letter, I have only to add a fact which may tend to increase confidence in a mode of preventing the disease which has been recommended by Dr. Haygarth, and used with success in several instances. The same dog which bit Mr. Todd's son, bit, at the same time, a cow, a pig, a dog, and a black servant of Mr. Todd's. The cow and pig died; the dog became mad, and was killed by his master. The black man, who was bitten on one of his fingers, exposed the wound for some time, immediately after he received it, to a stream of pump-water, and washed it likewise with soap and water. He happily escaped the disease, and is now in good health. That his wound was poisoned is highly probable, from its having been made eight hours after the last of the above animals was bitten, in which time there can be but little doubt of such a fresh secretion of saliva having taken place as would have produced the Hydrophobia, had it not been prevented by the above simple remedy. I am not, however, so much encouraged by its happy issue in this case as to advise it in preference to cutting out the wounded part. It should only be resorted to where the fears of a patient, or his distance from a surgeon, render it impossible to use the knife.

Philadelphia, July 27, 1803.

ARTICLE II.

OBSERVATIONS *on several* METHODS *of obtaining* OXYGENOUS GAS *in a very pure State. By* JAMES WOODHOUSE, *M. D. Professor of Chemistry in the University of Pennsylvania, &c.*

A CHEAP and easy method of obtaining oxygenous gas, perfectly pure, in large quantities, has long been a desideratum with chemists. The azotic air, with which this gas is generally contaminated, renders it improper to be used in many delicate operations. In decomposing hydrogen gas, carbonated hydrogen gas, and the oxyds of carbon, of the same quality, in the eudiometer of Volta, different results will happen, unless the oxygenous air be exactly of the same strength, or

unless it be completely freed of azotic air, which produces the variations in the experiments.

Dr. Priestley, who has had more experience in pneumatic philosophy than any other person, says, "to make dephlogisticated air perfectly pure is hardly possible;"* and the French and British philosophers recommend but one substance, the hyperoxygenated muriate of pot-ash, for this purpose.

This article is at present too dear in Europe to be much used by the chemist, and it cannot be procured in the United States.

Reflecting upon this subject, it occurred to me that an oxyd of mercury, prepared by boiling a solution of pot-ash upon turbith mineral, would afford the air in the state required.

Turbith mineral is made by boiling the sulphuric acid upon mercury, until a dry white salt is formed, upon which a large quantity of boiling water is poured. A part of the oxygen of the acid unites to the mercury, and converts it into an oxyd, which is dissolved by part of the acid forming sulphate of mercury. Another part of the oxygen of the acid seizes hold of part of its sulphur, and makes sulphureous gas, or volatile vitriolic acid, which escapes.

The hot water dissolves the sulphate of mercury, containing an excess of acid, and leaves a substance behind, of a yellow colour, which is called turbith mineral.

A considerable portion of sulphuric acid still adheres to this preparation, of which it may be freed by boiling it in a solution of pot-ash, but which cannot be separated by boiling it ever so long in water.

The pot-ash will unite to the sulphuric acid, and form sulphate of pot-ash, or vitriolated tartar; while the mercury will be left in the form of an oxyd of a brown colour. The sulphate of pot-ash being soluble in water, may be washed away from the oxyd of mercury.

The agents employed in manufacturing this article are sulphuric acid, or oxygen and sulphur, mercury, pot-ash, and water; neither of which, except the last, contains any azotic air, and this adheres to and is thrown away with the water. One ounce of an oxyd of mercury, prepared in this manner, submitted to a red heat in an iron tube, yielded forty cubic inches of oxygenous gas.

This air was examined by phosphorus, by the nitrous test, and by exploding it with hydrogen gas from sulphuric acid, diluted with water, and malleable iron.

* Medical Repository, vol. iii. p. 122.

A piece of phosphorus, the size of a duck-shot, was stuck upon the end of an iron wire, and introduced into one hundred parts of the gas, confined over water in an eudiometer. Upon approaching a lighted taper near the phosphorus, it immediately inflamed, an absorption of the water took place, and but two hundred parts of a measure of azotic air remained.

Four measures of nitrous air, from diluted nitric acid and copper, were added to one of this oxygen gas, in an eudiometer. The first gave an absorption of 120, the second 134, the third 150, and the fourth 70.

Two cubic inches of this oxygen air, and four of hydrogen gas, exploded by the electric spark, in the eudiometer of Volta, left one fourth of a cubic inch of air, which was principally azotic.

The materials and apparatus employed in making this oxyd of mercury are not very expensive, nor are the operations difficult or troublesome.

The acid may be boiled upon the mercury in an oil-flask, and the boiling water may be poured upon the dry sulphate of mercury in powder, in a queen's ware wash-hand bason. When the sulphate of mercury, containing an excess of acid, is washed away, the remaining sulphate of mercury, or turbith mineral, may be digested a few hours in a hot solution of pot-ash, which will free it from every particle of the sulphuric acid. The greatest part of the mercury may be saved when the air is obtained from the oxyd, for it will be found in a revived state in the iron tube.

If turbith mineral, which has not been digested with a solution of pot-ash, is exposed to a red heat in a close vessel, having a syphon in its mouth, it will afford oxygen gas, and a quantity of the sulphate of mercury of a white colour will sublime from it, adhere to the side of the vessel, and fill up the bore of the syphon; hence it is best to use the oxyd prepared from this salt by means of pot-ash.

A second method which was tried to procure oxygen gas in a pure state, was by exposing the leaves of vegetables to the influence of solar light, in pump-water, which generally contains a portion of carbonic acid, or in boiled and distilled water, impregnated with this air.

A small handful of the green leaves of any plant will yield six, eight, or ten cubic inches of oxygenous air, when exposed to the action of the sun in one hundred and forty cubic inches of the pump-water of this city; and, provided the air

was pure, as we would expect *a priori*, for it arises from the decomposition of the carbonic acid, which contains no azote, it could be obtained in sufficient quantities, in the summer season, for chemical experiments. A small handful of the healthy leaves of Datura stramonium, Phytolacca decandra, and Polygonum aviculare, were separately exposed, eight hours, to the light of the sun, in one hundred and twenty cubic inches of pump-water, which was known to contain carbonic acid, and in the same quantity of boiled and distilled water, impregnated with this air.

From six to eight cubic inches of oxygen gas were obtained from the leaves of each plant.

Phosphorus, inflamed over water, in one hundred parts of this gas, absorbed 70 parts: the remaining 30 parts were azotic air, as appeared by the nitrous test.

Three measures of nitrous gas were added to one of this oxygenous air. The first gave an absorption of 100, the second 105, the third 0.

Two cubic inches of this oxygen gas, exploded in the eudiometer of Volta, with four cubic inches of hydrogen gas, left two cubic inches of inflammable and azotic air.

From whence came this azotic air with which the oxygen gas was so highly contaminated? Was it separated by the light and heat of the sun from the water, or was it excreted by the leaves?

As it is difficult, and perhaps impossible, to throw off all the azotic air which water contains, by boiling or distilling it; and as the Galvanic influence, passed through boiled and distilled water, always separates a considerable quantity of azotic gas from it, there is no doubt but that this air was contained in the water.

The contamination, however, is so great, that the oxygen gas, procured in this manner, cannot be used in nice experiments.

A third method which presented itself of obtaining pure oxygen gas was from the oxyd of manganese.

This metallic substance often contains carbonate of lime, always azotic gas, and frequently carbonic acid, which it absorbs from the atmosphere.

Two ounce measures of sulphuric acid, diluted with a pint of water, were boiled one hour upon half a pound of the oxyd of manganese, in fine powder, in a glass retort, the mouth of which entered a jar, filled with water, and placed upon the shelf of an hydropneumatic tub. Fifty cubic inches

of air were obtained, forty-six of which were carbonic acid gas, and four azotic air. The acid being washed away from the oxyd, a portion of it was exposed to heat in an iron tube, and it afforded oxygen air perfectly free from carbonic acid gas.

Phosphorus, placed in twenty cubic inches of this air, over water, absorbed nineteen inches of it, and left one cubic inch of azotic gas.

The same quantity of oxygen air, from the same kind of manganese, upon which no acid had been boiled, treated in the same manner, left two cubic inches of azotic gas.

Two cubic inches of oxygen air, from the purified manganese, exploded with four of hydrogen gas, left one fourth of a cubic inch of oxygen and azotic air.

The oxygen air from manganese, upon which no acid had been boiled, treated in the same manner, left one cubic inch of hydrogen and azotic gas.

Four measures of nitrous air were added to one of the oxygen gas, from the purified manganese: the first gave an absorption of 120, the second 145, the third 115, and the fourth 15.

Four measures of the same air were added to one of the oxygen gas, from manganese not boiled in the acid. The first gave an absorption of 120, the second 130, the third 100, the fourth 0.

Phosphorus, fired in 100 parts of the oxygen gas, from the purified manganese, left three hundred parts of a measure of azotic air.

One hundred parts of the oxygen gas, from the manganese to which no acid had been added, treated in the same manner, left five parts of azotic air.

The quantity of azotic gas contained in this oxyd of manganese was very small, and the greater part of it was thrown off with the carbonic acid, by the sulphuric acid and water.

Exposing the purified manganese, in an earthen retort, to a red heat, the oxygen air obtained was found to contain ten per cent. azotic gas. A part of the atmospheric air entered the pores of the heated retort, and mixed with the oxygen gas: hence an earthen vessel never should be used when it is necessary to have oxygen air very pure.

Although many writers say that oxygen gas can be procured perfectly pure from the hyperoxygenated muriate of pot-ash, yet I never could obtain it of a higher degree of purity than the air from the oxyd of mercury, from turbith mineral by

pot-ash, or from manganese boiled in sulphuric acid and water. Upon comparing the oxygen gas from these three substances, no difference could be observed between them. The oxygen air, from the oxymuriate of pot-ash, devoured nearly four measures of nitrous gas, yielded two per cent. azotic air, when phosphorus was fired in it, and left one fourth of a cubic inch of azotic and hydrogen gas, when two cubic inches of it were exploded with double the quantity of hydrogen gas.

My experiments on this subject exactly coincide with those of Dr. Priestley, and it is highly probable that oxygen gas never has been obtained in a state of perfect purity.

There are several other oxyds of mercury, besides that from turbith mineral, from which oxygen air may be obtained very pure, as mercurius precipitatus per se, the oxyd from red precipitate, boiled in a solution of pot-ash, to free it from every particle of nitric acid it may contain; but these preparations are very expensive.

Having examined two hundred cubic inches of the oxygen air from nitre, as it was produced, the first few cubic inches were found to be mixed with six per cent. of azotic air, which gradually increased until it amounted to forty parts in the hundred, which the last portions contained; so that the air from this salt scarcely deserves the name of oxygen gas.

ARTICLE III.

Observations *on* Vaccination: *By* John Redman Coxe, *M. D. of Philadelphia.*

ON the 9th of May, 1803, I vaccinated Molly Allen, a mulatto of 25 years of age, at the Philadelphia Dispensary. She was at this period, in every respect, in perfect health. The infection I employed was a year old, had been carefully taken from a very fine pock on the eighth day, and preserved between glass, coated with gold-beater's skin. As this was merely for an experiment, I was not surprised at its failure. On the 18th I repeated the attempt with infection of the 10th day, two days old, by *two* punctures of the right arm. This took effect in *one* of the punctures, and a fine pock commenced its career. On the eighth day I obtained infection; at which period there was great local itching, with commencing tumefaction of the axillary glands, and fe-

brile irritation. The pock was not much larger than is common at this stage. On the ninth day, from the great tumefaction of the skin around the pock, I was satisfied of the existence of the areola, though I could not perceive it accurately till the following day, when the pock had been irritated by a rough gown. On the ninth day I renewed the vaccination from her own pock, about two inches below the first, by a single puncture. I was at this period pursuing some experiments to ascertain the constitutionality of the disease by the progress of a second vaccination, as proposed by Mr. Bryce, when the symptoms are so moderate as not to be discernible.* Although the constitutional disease had here commenced its career, and though the areola of the first pock was in existence, it took effect, and advanced with such rapid strides, that its areola came on as early as the third day, when the pock was only beginning to evince its successful progress. Its scab came off on the 6th of June, or the twelfth day from the deposition of the infection: whilst the scab of the first adhered till the 10th. On the tenth day several little fiery-looking pimples appeared around the original pock, some within and some without the areola, which disappeared in a few days. She had been very inattentive, by using her arm in the freest manner, to wash, &c. in opposition to my strict advice. She complained much of pain in the axilla, the glands of which continued to enlarge. The pock was now nearly half an inch in diameter, very perfect, and turgid with a limpid fluid. From the irregularity of the patient I did not again see her till the fourteenth day. She informed me she had the preceding day struck the pock against the lock of the safe (for provisions), which had broken it, and the matter had oozed out in great abundance, as might be readily expected; for it was now considerably upwards of an inch in diameter. The second pock appeared to be fully one fourth of an inch, though it was barely the termination of the fifth day. In the primary pock a scab had commenced in the centre, and was about one third of an inch over. The edges were plump,† well defined, and elevated at least a quarter of an inch, with a hard tumid base of between three and four inches diameter. It was accompanied with great

* This practice I uniformly employ when in my option, and I cannot but recommend it to the serious consideration of every friend to vaccination.

† Excepting the part struck, from which a considerable quantity of fluid oozed.

itching, and the febrile symptoms were urgent for several days, though by no means so much so as I expected from the appearance of the disease and its repeated irritations. I now ordered a smart purgative, and abstinence from animal food, with the local application of lead-water; and without much difficulty (although considerable irritation was produced by two or three subsequent blows upon it) it pursued its course to a favourable issue; for by the 17th day the scab was more than half an inch over; whilst the circumference was greatly augmented, and had commenced an irregular desiccation, owing, I presume, to the continual rupture of the edges from blows, &c. Hence the uneven appearance of the outline of the pock at this period. In a few days the scab was perfectly formed, and fell off in separate pieces; owing, I imagine, to the constant moisture applied to it, which had allowed the cuticle to contract irregularly. I was, however, fortunate enough to obtain the largest portions, which I sent to Dr. Jenner, and which will serve to evince, in conjunction with the Mammoth, that neither nature nor disease are in this country disposed to *belittle* themselves.—Jesting apart: That this was a case of a pock of a natural size in the patient, independent of external causes, is evinced, from its having arrived to a considerable size before any injury whatever was sustained. The second vaccination from herself proves the same. By this no injury was sustained, and in the short space of six days it had progressed beyond the usual size of the vaccina. The small fiery looking pimples I mentioned had nothing to do with its augmentation, as they disappeared in a very short period after their first accession. I have repeatedly seen pock which have gone on increasing for several days after the areola had declined, and the scab had commenced in the centre, but I do not think any of them exceeded six tenths of an inch.

I do not know if any peculiar deductions can be drawn from this curious instance of uncommon magnitude. It may, however, serve to prevent uneasiness in the minds of physicians or their patients, by assuring them of an equally fortunate termination with a smaller case of the disease, even under circumstances of repeated irritation. It was to me, for several days, a source of anxiety, which I would wish to prevent in others.

One circumstance in this case deserves to be noticed, though it is by no means singular: I allude to the successful event in one puncture, and the complete failure of the other, though similar in every respect. Does this arise from an absolute in-

disposition of the absorbents, in one point, to take up the infection, whilst, in another, they shall act with vigour? It may sometimes, doubtless, occur from unnecessary irritation, producing inflammation and suppuration before the absorbents have taken up the matter deposited; but I have seen it in many cases where I am sure nothing of the kind had occurred. In my own arm, of three portions of thread, the *middle* one failed; and in cases 33 and 34 (see my pamphlet, note at page 41), infection of eight days old failed; yet the *very same* portion succeeded, when five days older, in the same subjects. From these facts an important deduction may be drawn, viz. when infection is scarce, not to imagine it has always lost its activity when it fails to infect, but rather try it again and again.

On the day I vaccinated Molly Allen I also vaccinated her daughter Betsy, three years old, with infection sent me from London, and then four months old. I never saw the child afterwards (such is the general indifference of Dispensary patients), but was told she passed through the disease very favourably. If it was in reality the genuine disease, which, from the description, I imagine it to have been, it is an additional proof of the length of time the infection will occasionally retain its activity. It is worthy of investigation on what this depends, that it in some cases is so well preserved, whilst in others, secured with equal care, it almost constantly fails.—It may not be uninteresting to remark, that this very infection, when but two and an half months old, failed in a child of the same age. This child, however, resisted two previous attempts, and also four subsequent ones, with infection of different ages. The eighth attempt, with infection of the ninth day, *succeeded*, when five days old, although the identical portion *failed* when recent. On the 6th day I revaccinated her effectually from the first pock: an areola began its career the following day; and the child passed through the disease in the most favourable manner.

I have found considerable difficulty to excite the disease during the hot weather. In this I do not appear to be singular. Even recent matter has not uniformly succeeded. I do not believe, with some, that the infection loses its activity from the heat, at least in so short a period; because the first infection I employed with success, from England, and which must have been upwards of two months old, was enclosed between two portions of glass, whose edges were surrounded with a pretty thick coat of sealing-wax. Now, the heat required to

melt the wax is far greater than the most extreme degree of summer heat, and it must have been communicated, in a very considerable degree, to the glass and the enclosed infection.—Again: The heat of the human body, which is greater than that of the atmosphere, as indicated by the thermometer, does not decompose or destroy the virus, though carried for many days in the waistcoat or breeches pocket. Now, if a *greater* cause does not produce a certain effect, a *lesser* cannot be supposed to be more powerful; unless, indeed, we can imagine something specific in solar heat to effect the destruction of vaccine infection.

I am rather disposed to view the difficulty of exciting the disease in hot weather as arising more from a mechanical cause; not, however, denying the probable influence of long-continued heat in destroying the vaccine infection. The constant and copious discharge from the exhalent extremities of the arteries preventing absorption, by washing away the small portion of infection applied, may, perhaps, in part, account for it. In some instances, either a *general* or *local* indisposition to receive the disease, may be a source of error in this respect; for, I believe, if the experiment be fairly made, it will be found that, of a given number, some one or more will take the disease in the hottest season, if vaccinated with the same infection, provided it has not actually gone beyond the usual limits of two or three weeks, in which we find it efficacious in cooler weather. If my suspicion is well founded on this point, I think it probable a portion of infected thread, introduced below a slight elevation of the cuticle, *undiluted*, and secured with a small strip of gold-beater's skin, would be more generally successful in the summer; and I should be happy to see it fairly tried. I know, from experience, that *plentiful dilution* is not unfavourable to the success of vaccination; but this is very different from exhalation continually going on from the surface, by which all entrance is denied. Dilution, indeed, I rather apprehend, favours it greatly, by allowing the absorbents to take up a small portion whilst in this state of minute division. We know it does not depend upon the *quantum* of infection introduced to insure success. A single atom is as sure as a thousand in a state of predisposition. In one case where I employed infection very largely diluted, the puncture, owing to the struggling of the child, was made deeper than requisite; and at least two drops of blood gradually oozed out, uniting with the infection on the point of my lancet. Despairing of effecting my purpose in

a better manner, I told the mother I would call when the child was asleep, and repeat the attempt. On the third day, going with this intention, I was in the highest degree astonished to see a most beautiful little pock commencing its progress, which ran its course with the utmost regularity.* I do not suppose the infection amounted to a five hundredth part of the fluid in union. Perhaps even that is a large allowance. This, however, need not surprise us, when we recollect the successful impregnation of the ova of the frog with the semen of the male, diluted to a great degree, according to experiments of the celebrated Spallanzani.†

I have repeatedly tried the efficacy of infection of various ages up to eighteen months; yet, though it was secured between glass covered with gold-beater's skin, four months is the longest period in which I have succeeded. In these long periods some decomposition appears to take place, as a considerable difficulty occurs in promoting its solution with water: the infection appears as if united with a resinous matter, or as if some grease was triturated with the water. I have found something like this in infection of a much earlier date; and have uniformly failed in exciting the disease when this has been the case.

The valuable discovery of Mr. Bryce, of Edinburgh, that the vaccine scab possesses the property of exciting the disease as perfectly as the recent infection, is of the highest importance to the medical practitioner. I was so fortunate as to succeed in producing the effect, in my first attempt, with a scab which had lain in my closet in a piece of paper for two

* In this case, about the twelfth day, a vaccine pock was discovered between the nymphæ; causing great uneasiness and pain in making water, owing to the tumefaction and inflammation. Its perfect appearance was destroyed before I saw it, owing to scratching, &c. but its regularity, and other coinciding circumstances, satisfied me of its being a secondary pock, induced probably by accidental deposition of the infection from the fingers of the child, who was constantly scratching the original pock. Lead-water, and a few mild laxatives, moderated the febrile symptoms, and the child was well in the usual period.

† By these experiments it appears he succeeded in impregnating the female ova, by a solution of three grains of the seminal fluid of the male to a pint of water, which is only the $\frac{1}{2560}$ of the whole. He even successfully impregnated several ova with a solution of three grains to twenty-two pounds of water, or the $\frac{1}{56320}$ of the mass. A drop of water, scarcely visible, taken up by the point of a needle from a mass of eighteen ounces of water to three grains of the semen, was frequently successful, even when several globules were touched with it; though the diameter of the drop did not exceed the $\frac{1}{50}$ of a line.—See vol. ii p. 190, &c.

months. Since this I have repeatedly employed it, and in most instances successfully. Many of our practitioners have also used it with success. Whether it is generally known throughout the continent I cannot say. I endeavoured to promulgate it, as soon as I had verified the fact, by publishing an account in Poulson's Gazette. Our other printers did not, I believe, think it worthy of attention, as it was not copied from Poulson. I hope the country printers gave it a place, for it is of great consequence to have it generally known. It appears hitherto to have escaped your very useful publication.

I have heard some gentlemen say they think the scab as effectual as recent infection; whilst others repeatedly failed. On what does this difference depend? I think a failure in the use of the scab may arise from the following causes.

1. A secondary scab, arising from *common* inflammation, (in consequence of the primary and genuine scab having been rubbed off prematurely) possessing none of the genuine infection, may occasionally have been employed. When this is the case, it is evident that every attempt to excite the vaccine disease must prove abortive.

2. The external covering of the vaccine pock is nothing but cuticle. If this part be moistened, as only a solution or diffusion of cuticle is the result, no vaccine disease can be excited.

3. The internal surface of the vaccine scab is frequently covered with a quantity of pus, the product of simple inflammation, arising from the scab being prematurely raised from its connection below, and not completely removed. It is clear that a solution of this alone can never induce the genuine disease; and I am doubtful if its admixture with a portion of genuine scab may not tend to induce a spurious affection. To obviate this, I have generally macerated a small piece of scab, for a few seconds, in three or four drops of water, which I have then suffered to run off, by inclining the surface of the glass which I use. A fresh drop of water now applied to it is certain of uniting with pure and uncontaminated vaccine infection.

4. The free use of cold, or of lead-water, may promote, in some measure, the solution of the concrete vaccine fluid, which may then be carried off by the lymphatics; or it may in some way decompose it.

Is not the successful employment of the vaccine scab a sufficient answer to those who dread to take the infection after the areola commences? In a letter from Dr. Ramsay, of

Charleston, of April 14th, to me, acknowledging the receipt and successful employment of some vaccine infection, and a scab which I forwarded, he says—"The successful inoculation by the scab appears to me to be decisive of the controversy on which Dr. Pearson and yourself have taken one side, and Drs. Jenner and Waterhouse the other: I mean the sacred boundary of the *areola*, beyond which the latter say we ought not to vaccinate."—But though Dr. Jenner had considered it as a sacred boundary in the early stages of his practice, it does not appear by his letter to Dr. Waterhouse of March 4th, 1801, that he supposed the infection more likely to produce a spurious disease, but merely, "that the activity of the virus begins to diminish upon the formation of the efflorescence;" and adds—"I do not presume to say that, after this period, the fluid is effete—*certainly it is not;* but that it frequently occasions disappointments, my early trials sufficiently testify, and those of others in whose accuracy I can rely." I do not think sufficient experiments have yet been made fairly to determine the point in dispute; and this has arisen from the extreme dread which physicians have had of exceeding the limitations pointed out very early by the illustrious Jenner. I do not find that my experiments lead so strongly to the same conclusion. Indeed, the success of the scab, in which the identical infection, in a concrete state, is yet *older*, seems to controvert it completely. At all events, it must serve to diminish our apprehensions of inducing a spurious disease, and allay our disappointment in finding a failure more frequently to occur, if such is actually the case.

It does not yet appear to be settled, whether a person can take the vaccina after having had the small-pox. Though it is certainly difficult to produce it, cases of this description are too numerous to doubt the possibility. I can mention at least half a dozen instances which have come within my knowledge, and many may be collected from the writings of Jenner, Ring, and others. If the cases are considered as instances of local affection, *why does it happen that all further disposition to produce a local disease is lost?* With respect to myself, I took the disease immediately; whilst others, who had never gone through the small-pox, vaccinated with the same matter, and almost at the same moment, required a repetition to induce it. I have ineffectually attempted, in at least *thirty* instances, with recent infection, to re-produce the disease in myself.—Does this look like the result of a local impression?

Before I conclude I must notice a mistake which Dr. Waterhouse has fallen into, at page 35 of his valuable publication, where he says—"It is remarkable that neither at New-York, Philadelphia, Charleston, nor Savannah, did any of the vaccine matter, repeatedly imported from London by different practitioners, *ever* communicate the disease." By referring to my pamphlet, he will find that the eighth case (noticed in the tables) had the disease, both from the infection I procured through President Jefferson, and from some I received a day or two afterwards from Mr. Ring. The child had five pock, two of which were from the last mentioned stock; and from this English source I communicated the disease to case 11, and again from this to case 20: so that, at the same time, it was spreading in this town from a double source. What was more to the point was, the coincidence of the disease produced by each proving its genuine nature—at that early period of vast importance and utility to me.

I meant to have said something relative to the point of revaccination about the fifth day, as recommended by Mr. Bryce, to test the constitutionality of the disease produced; but I have already far exceeded, I fear, the limits of a communication for a work of the nature of the Medical Repository. I can only apologise from the wish to advance, as much as lies in my power, the knowledge of this wonderful prophylactic, which is yet, indeed, imperfect, but is daily becoming better understood.

Philadelphia, August 1, 1803.

ARTICLE IV.

A CASE *of* FRACTURE *of the* OS HUMERI, *in which the broken Ends of the Bone not uniting in the usual Manner, a Cure was effected by means of a Seton. Communicated to Dr.* MILLER *by* PHILIP S. PHYSICK, *M. D.*

ISAAC PATTERSON, a seaman, twenty-eight years of age, applied to me in May, 1802, in consequence of a fracture of his left arm, above the elbow joint, which had taken place several months before; but the ends of the bone not having united, rendered his arm nearly useless to him.

The history he gave me was, that on the eleventh of April, 1801, after having been at sea seven months, his arm was frac-

tured by a heavy sea breaking over the ship. Nothing was done for his relief until next day, when the captain and mate bound it up, and applied splints over it. No swelling supervened, nor did he suffer any pain. Three weeks after this accident, he arrived at Alexandria, when the state of the arm was examined by a physician, who told him, that the ends of the bone were not in a proper situation. After making an extension, the splints and bandages were again applied. He remained in Alexandria four months, when, finding his arm no stronger, he left off all dressings, and went on board the New-York frigate as steward: in this capacity he remained near the Federal City six months, and by being under the necessity of using his arm as much as possible, he found the connection between the ends of the bones became looser and looser, till, at length, the arm bent as easily as if a new joint had been formed at the place of the fracture. From the frigate he went to Baltimore, where an attempt was made by machinery to extend the arm, and keep the ends of the bone in apposition, by continuing the extension. Under this treatment he remained two months, but experiencing no benefit, he was advised to come to Philadelphia. On examining the arm, I found that the humerus had been fractured about two inches and a half above the elbow joint, and that the ends of the bone had passed each other about an inch: the lower fragment, or that nearest the elbow, was situated over and on the outside of the upper portion of the bone. The connection that existed between the ends of the humerus was so flexible as to allow of motion in every direction, and, by forcible extension, the lower end might be pulled down considerably, but never so low as to be on a line with the end of the upper extremity.

He was admitted into the Pennsylvania hospital the latter end of May; but the weather becoming very hot, it was judged best to defer any operation that might be necessary until the fall of the year. Unfortunately he then contracted a bilious fever, of which he was so ill that his life was despaired of for some days. From this fever his recovery was so slow, that it was not thought proper to perform any operation until December. It still remained to decide by what means a bony union of the humerus might most probably be effected. In the year 1785, when a student, I had seen a case in our hospital similar to this in every essential circumstance, in which an incision was made down to the extremities of the fractured bone, which were then sawed off, thereby putting the parts into the condition of a recent compound fracture. No benefit how-

ever was derived from this painful operation, and some months afterward the arm was amputated. This case had made a strong impression on my mind, and rendered me unwilling to perform a similar operation. I therefore proposed to some of the medical gentlemen of the hospital, who attended in consultation, that a seton-needle, armed with a skein of silk, should be passed through the arm, and between the fractured extremities of the bone, and that the seton should be left in this situation, until, by exciting inflammation and suppuration, granulations should rise on the ends of the bone, which uniting, and afterwards ossifying, would form the bony union that was wanting. This operation being agreed to, it was performed on the 18th of December, 1802, twenty months after the accident happened. Before passing the needle, I desired the assistants to make some extension of the arm, in order that the seton might be introduced as much as possible between the ends of the bone. Some lint and a pledget were applied to the orifices made by the seton-needle, and secured by a roller. The patient suffered very little pain from the operation. After a few days the inflammation (which was not greater than what is commonly excited by a similar operation through the flesh, in any other part) was succeeded by a moderate suppuration. The arm was now again extended, and splints applied. The dressings were renewed daily for twelve weeks, during which time no amendment was perceived; but soon afterwards the bending of the arm at the fracture was observed to be not so easy as it had been, and the patient complained of much more pain than usual whenever an attempt was made to bend it at that place. From this time the formation of the new bony union went on rapidly, and, on the fourth of May, 1803, was so perfectly completed, that the patient could move his arm, in all directions, as well as before the accident happened. The seton was now removed, and the small sores occasioned by it healed up entirely in a few days. On the 28th May, 1803, he was discharged from the hospital, perfectly well, and he has since repeatedly told me that his arm is as strong as it ever was.

ARTICLE V.

An ACCOUNT *of the* MEASLES, *and some other* DISTEMPERS, *as they appeared in several Towns in the District of Maine, from January*, 1802, *to January*, 1803. *Communicated by Dr.* JEREMIAH BARKER, *of Portland.*

FROM the first of January, 1802, to the 22d of February, the weather was unusually moderate and rainy; scarcely any snow falling during this period.

On the 22d of February a violent N. E. snow-storm commenced, and continued for five days, with very little abatement.

During the spring months, the weather was remarkably cold and wet, so that vegetation was in a very backward state. The summer was cool and rainy; the fall, for the most part, dry and pleasant.

In January the measles appeared in some of our interior towns, and progressed to the sea-ports, where it made its appearance about the middle of March, and was very prevalent till June, when it disappeared. The distemper, however, continued in several country villages, in scattered instances, till the close of the year.

The symptoms which characterized the measles pretty uniformly commenced and progressed in the following order, viz.

A disturbed and nauseated stomach, chilliness followed with heat, pain in the head, heavy and watery eyes. On the first or second day, a soreness of the throat was generally perceived, and a cough supervened; pulse quick, and in plethoric habits full.

On the third day these symptoms were increased, and the patient was thirsty; tongue white and moist.

On the third or fourth day, a spontaneous vomiting and purging sometimes took place, and on the latter of these days the eruption appeared.

When these evacuations took place to any considerable degree, the fever was reduced, and the eruptions were not remarkably numerous; the cough also was moderated. But when a vomiting and purging did not occur, the fever continued to increase, and the eruptions seemed to be proportionally numerous. The face too would swell, and the eyes become red and pained; the cough distressing, and respiration laborious.

Besides pain in the stomach, diarrhœa and bloody stools frequently occurred; but when these gastric and intestinal affections were considerable, the other symptoms were much less violent.

In some few instances there was no cough, nor soreness of the throat.

A great proportion of the sick were attended only by nurses, who, in general, confined their patients to their beds, and administered snake-root tea and spirits.

I am credibly informed, that in the spring months, sixteen persons, chiefly adults, died of the measles, in a remote country town, under this mode of treatment.

In several other towns more or fewer have died of this distemper.

The first cases of measles to which I was called, occurred in the middle of March. Seven were attacked in one family. Two of these were seized with vomiting and purging on the fourth day, when the eruption began to appear. I was then called, and found that the discharges were profuse. The matters ejected by vomit were green. I gave an aqueous solution of alkaline salts between the vomitings, which soon ceased, and a moderate eruption came on, without any considerable fever. Cool air, as well as water were allowed, and the patients readily recovered. Their ages were ten and sixteen. Another in the family, a boy aged six years, was attacked with the disease, though not violently. I was called on the fourth day, when the eruption began to appear. No evacuations had taken place. I left an emetic, as also a cathartic. The emetic was omitted, but the cathartic was given, which operated freely. Cool air, as well as water were allowed; but the fever increased, and a full eruption came on. I was called again on the ninth day, when his bowels were tense, pained, and sore to the touch. His pulse was quick, and respiration hurried. His tongue was dry and dark coloured, and he was very thirsty. I then gave an alkaline emetic, which operated five times, and ejected much dark green matter. A dose of castor-oil was then given, and his stools were of a bottle-green colour. After this, a scruple of sal. sodæ was given once in two hours, until two drams were taken, when he asked for food, and soon recovered.

The recovery of this patient, who was considered by his friends as hopeless, made a happy impression upon the minds of many in favour of alkalizing and cleansing the stomach and intestines in the measles. To the other four alkaline emetics, and alkaline and oily cathartics were given on the second day

of the disease; and although two of them were violently seized, the fever readily abated, and the eruption was not full. They soon recovered.

In April, a girl, ten years old, was attacked with a disturbed stomach, chilliness, great pain in the head, and a dry cough. I was called on the first day, when her pulse was full, and her eyes were red and watery.

I gave tart. emet. three grains, sal. absinth. thirty grains, which operated ten times as an emetic, and produced several cathartic operations. The fever and pain then subsided, and the next day she was pretty free from complaints, excepting the cough, which was much less troublesome.

She continued in this comfortable state, going out of doors as usual, till the fourth day, when a moderate eruption came on. Very little fever supervened. On the eighth day the eruptions disappeared, and the cough ceased.

In June, a girl, aged fifteen years, was attacked in a similar manner, excepting the cough. I was called on the third day, when she complained of pain in the bowels, and her stools were frequent, as also very bloody.

An alkaline emetic was then given, which ejected a large quantity of dark green matter. After this, thirty grains of sal. sodæ were given once in two hours, and two ounces of lime-water as often, also an opiate at night. On the fourth day a slight eruption took place, but no cough, nor any considerable fever. On the eighth day her complaints ceased, and she soon recovered. Several other very similar cases occurred.

In July, a middle aged man, after the measles had run their course, was attacked with vomiting, and ejected much black matter. He expired a few hours after.

His nurse has since informed me, that she gave him several doses of jalap and calomel during the disease, which operated freely through his bowels, but nothing had been thrown up from his stomach before the black vomiting came on.

The nurse was now convinced, as she said, that purges did not cleanse the stomach, and greatly regretted that he had not taken a seasonable vomit.

I think it a matter of equal regret, that some practitioners in medicine still dispense with emetics in other distempers, depending upon a poisonous cause, notwithstanding that Dr. Rush and Dr. Miller, as well as other learned and experienced physicians, have taken so much pains to inculcate their use and importance. But it is earnestly to be hoped, that epidemic fevers of every denomination will soon be spoken of by all phy-

sicians as *cases of poison*, and treated accordingly, as suggested by Dr. Mitchill, in his important letter to Dr. Percival. (Med. Rep. vol. i. p. 253.) Then, it is presumed, the poison of pestilence would cease to crowd our grave-yards with so many untimely deaths.

In August and September the measles, for the most part, invaded the patients with vomiting and purging, thirst and fever, resembling the *cholera* in every respect excepting the eruption and cough, though this last symptom was not a constant attendant.

The scarlatina, or rash, in some instances, preceded, in others succeeded the measles, but it was generally mild.

From the middle of March to the last of September, I attended one hundred and forty patients in the measles, most of whom were violently seized; for when the disease invaded mildly, physcians were seldom employed.

In the treatment of the measles, my aim has uniformly been to counteract the poisonous cause, as in other epidemics.

Emetics, alkalines and oils have, therefore, been the chief means which I employed.

Cool air, as well as cold water, were allowed, and the patients debarred, as much as possible, from the heat of the fire, and from their beds.

By attending particularly to this mode of treatment, I feel myself furnished with sufficient evidence to believe, that this distemper may be so greatly moderated in its morbid effects, as to be attended with very little danger; for out of this number I have not lost a single patient; neither have any very troublesome local affections taken place.

I have been called, however, to a considerable number after the measles had run their course, and where emetics, alkalines, and oils had not been employed, who laboured under distressing gastric and intestinal complaints. In a few instances convulsive fits occurred. Others were molested with pain in the sides, a distressing cough, and great hoarseness: in two instances, a total loss of voice for several weeks. But none of these symptoms have supervened where the mode of treatment which I have pursued has been seasonably and duly attended to. Some of my brethren, who have employed these means, have been equally successful.

In August a malignant fever appeared in North-Yarmouth. "The fever which has lately appeared in North-Yarmouth," says Dr. Banks, in a letter, dated September 11, 1802, "is supposed by some to have been imported from the West-Indies in

a vessel. The truth is, when the vessel which lately arrived here was in Cape-François, one of the crew died of a fever.

"Measures were then taken to cleanse the vessel; but they were far from being adequate, consisting only in fumigating with burnt vinegar and lemon-juice!

"On her arrival here, a considerable number of persons went on board, supposing her to have been properly cleansed. Shortly after the most of them sickened of a malignant fever, and some died; but none of their visitors nor attendants have taken the disease from them.

"The stomach in this fever was, for the most part, very irritable, so that every thing was ejected as soon as taken; and the pain in the head, back, and loins was severe. The pulse was quick and fluttering; the skin hot and dry, and the thirst for water great. In but one instance did I perceive any yellowness of the skin.

"The remedies which we employed were, emetics, cathartics, alkalines, and oils. Of the propriety of emetics in fevers I have long been convinced. They do good not only by ejecting the febrile poison and ingesta, but also by exciting a new action in the system, subversive of the original morbid one.

"As a cathartic, the castor oil was very suitable; but when there was great constipation in the bowels, jalap and calomel was preferred after an emetic, and then the oil was used occasionally.

"Our alkaline remedies consisted chiefly of sal. absynth. and sal. sodæ. These we found to be highly efficacious.

"Dr. Mitchell and myself attended three patients in this fever, whose symptoms were very formidable. One died on the fifth day, to whom medical aid was not called till the third.

"Several others who were exposed to the noxious air of the vessel were invaded with the disease, and, I presume, would have suffered its ravages, had not emetics and alkalines been seasonably interposed."

In October I made a tour to the southern parts of Massachusetts, with a view of visiting my brethren, and collecting medical facts.

On the seventh of October I proceeded as far as Biddiford, in the county of York, where I obtained from a physician, an account of a malignant fever which had prevailed in that town, from the middle of June past to the beginning of October, viz.

"On the eleventh of June, a brig arrived at Biddiford from Grenada. She was about two years old, remarkably

tight, and had never been cleansed with alkalines, neither had any soap been used on board for washing of clothes during the voyage.

"Twelve days before the vessel arrived at Biddiford, a boy was attacked with the usual symptoms of fever, and died on the fourth day: no other person sickened on board.

"As soon as the vessel had arrived, four men went on board and tarried a night. Five days after they were all seized with a fever, and all died in about one week from the attack.

"Soon after these men sickened the vessel was fumigated with brimstone, and gunpowder was flashed in her hold, agreeably to the advice of some masters of vessels, who had noticed this mode of purifying unclean and infected vessels in the West-Indies.

"After this, however, several persons who were exposed to the noxious air of this vessel were invaded with fever, and some died."

With some degree of propriety, I think the language of Cicero may be applied to these West-India fumigators, and to their adherents.

"*Quousque tandem abutere, Catalina, patientia nostra?*"

I do not mean to suggest that they are to be considered as conspirators; but merely to fumigate a nasty infected vessel with burnt vinegar and lemon-juice, or with gunpowder, and then to pronounce her clean, is, in my view, tantamount to a crime, unless such conduct should be imputed to the *sin of ignorance*.

Happy will it be for mankind, when those very important rules, issued by command of the President of the United States, in January, 1802, for "*preventing the offensiveness and noxiousness of septic vapours*," shall be generally known and duly attended to." (Med. Rep. vol. v. p. 453.)

When the owner of the brig, Dr. Porter, a respectable physician, who, at the time of her arrival, was in Boston, had returned to Biddiford, he was dissatisfied with this mode of cleansing a nasty and infected vessel by fumigation, and directed that she should be thoroughly washed, alkalized and ventilated. This being done, she became a wholesome habitation for a new crew.

But a malignant fever was considerably prevalent during the summer and first fall month, in that part of the town where the first patients sickened, though it seldom invaded more than one or two in a family, however numerous.

In the summer, besides bleeding when indicated, cathartics and mercurials were the chief means employed; but the greater part died, as the attending physicians informed me.

In September I was called to one of these patients, a lady of a debilitated habit, aged 40, on the fourth day of the disease. This patient was attacked, as I was informed, with a nauseated stomach, moderate pain in the head, and a slight diarrhœa; pulse quick, but not full nor hard; so that blood-letting was not indicated. She had taken an emetic of ipecacuanha, but it did not operate; her intestines, however, were repeatedly evacuated with jalap and calomel, and the mercury had evidently affected her throat and mouth. She died on the sixth day. In several other cases, where calomel was used, the throat and mouth were very sore, as I was informed; yet, in some of these instances, the disease proved fatal.

In the fall, emetics, cathartics, alkalines and sudorifics were employed in several cases, and uniform success attended.

The following case was communicated to me by a physician in Biddiford.

"The first of October a young man was attacked with a nauseated stomach, oppression of the præcordia, pain in his head, loins and chest; pulse quick and oppressed. In twenty-four hours his tongue acquired a dark colour, and there was a considerable hemorrhage from his mouth.

"At this time, blood-letting being premised, I gave four grains of tartar-emetic, which operated twelve times, and each of the vomitings was followed with an aqueous solution of alkaline salts. After this, castor oil was given as a cathartic, and an epispastic was applied to his chest. Forty grains of sal. absynth. were then given once in two hours in water, for three days, as also small doses of tart. emetic, and sal. nitri. as often. On the fourth day he was pretty free from fever, and perspiration was freely promoted. On the sixth day he sat up by a window, and was exposed to damp air. The next day he was attacked with vomiting, pain in his head, &c. another emetic was then given, and his complaints were removed. He soon recovered.

On the 15th of October I arrived at Boston, and was informed that a malignant fever had been prevalent in that town the season past.

The disease was confined to the southern part of the town, chiefly among the poor, who were lodged in small, nasty, and unventilated habitations.

A respectable merchant, who resided near this sickly place,

informed me that he had frequently seen these people purchase tainted meats in the market, during the hot weather, on account of their cheapness.

The disease was ushered in, as I was informed by one of the attending physicians, with a sense of heat in the stomach, nausea or vomiting, pain in the head and limbs; pulse not remarkably quick, nor full, so that blood-letting was seldom indicated.

In the vicinity of Boston I met with a physician of great experience and reputation, who informed me, that he had attended a very considerable number of patients in malignant fevers in the course of a few years past, and that he had generally been successful. Of his good success I was likewise informed by others. His mode of practice was, to cleanse the stomach with emetics, as well as the intestines with cathartics. These he frequently repeated, particularly the emetics. He also used the following formula as a febrifuge, viz. ℞ Sal. Absynth. ʒ i. Aquæ ʒ i. G. Trag. ℈i. M. The dose, from 20 to 30 drops in a cup of water. Calomel was likewise employed; as also blisters.

He informed me, that in a vessel just arrived from sea a few years since, four persons were attacked with the yellow fever. Three of these died, and before death blood was ejected from their stomachs. He was called to the fourth, and found that blood had been thrown up from his stomach; yet he gave a dose of tartarized antimony, which operated ten times as an emetic. No blood was brought up by these vomitings. His other remedies for fever were then given, and the patient recovered.

As I proceeded into the southern parts of Massachusetts, I met with a physician, who gave me an account of a fever which prevailed in Wellfleet, on Cape-Cod, in the summer and fall of 1770, and was attended with considerable mortality. This physician informed me that he attended nearly one hundred patients, which made about two-thirds of the sick.

The symptoms, according to his description, were not materially different from those which characterized the yellow fever in Philadelphia, 1793, as described by Dr. Rush.

This fever was supposed, by many, to have originated from the effluvium of black fish, which were caught in abundance, in the spring of 1770, and used by the farmer as manure, after the blubber was taken off. A large number of these fishes were also driven into a creek near the meeting-house, where their carcases putrefied, and the stench was very offensive to

the congregation when assembled. Some few, however, supposed that the fever might have been imported in a whaling vessel which arrived in the spring from the coast of Brazils, as a man had died of a fever on the passage, though the rest of the crew were not infected.

In the treatment of this fever, besides blood-letting in certain cases, seasonable emetics, as well as cathartics and neutral salts, were found to be attended with salutary effects.

In September, 1802, two aged persons, as a physician informed me, sickened with a malignant fever in a remote part of the county of Plymouth. One died on the sixth day, with hiccup and black-vomiting. The other recovered.

In the fatal case an emetic was not given, the cathartics were employed; but, in the other case, the stomach was seasonably cleansed with an emetic. They were situated on low ground, near a swamp, and lived in a very nasty hut. About the same time, nearly, a young woman was seized with a malignant fever, to whom cathartics and mercurials were given; but on the ninth day she was considered by her physicians as hopeless, and all means were laid aside. Her nurse, however, thought proper to give her one more jalap cathartic; but, through mistake, gave a tea-spoonful of powdered cantharides, which excited vomiting. She then discovered her mistake, and immediately called in the physician, who, at this critical juncture, did not hesitate to give an emetic, which ejected a large quantity of bottle-green matter, and she happily recovered.

In the fall, the measles appeared in Plymouth, and was remarkably prevalent. The disease, as a physician of that town informed me, not unusually affected the bowels, and produced dysentery, or seized the lungs, and brought on pneumony.

On my return, in November, through some of the inland towns, I was informed that the dysentery had been prevalent, and unusually mortal.

In the vicinity of Cambridge, as Professor Waterhouse informed me, the dysentery had been prevalent the season past, and great success had attended the use of alkaline salts in the disease, as he was informed by a respectable physician who made a liberal use of them.

In November and December the measles appeared in some country villages in Maine, which had escaped the disease. It was considerably prevalent, but not mortal.

The last of December a brig arrived at Portland from Jamaica. While the vessel was detained at that island, four of the crew were attacked with a malignant fever. Three were

sent to an hospital, where they were bled, purged, and took mercury; but these all died. The other patient remained on board, and took two grains of tart. emetic, which operated several times. He also drank freely of water, strongly impregnated with pearl ash, which he had on board; he took also some castor oil. His fever subsided in a few days, and he recovered.

After the goods were taken out of the vessel at Portland, the mate cleared out the filth from the bottom of the hold. A few days after, he complained of loss of appetite, stomach sickness, and great pain in his head, to which succeeded thirst and fever. An alkaline emetic was administered on the second day of the disease, and castor oil, as well as alkaline salts, were liberally given. His fever was subdued by the sixth day, and he was soon restored to health.

ARTICLE VI.

REMARKS *on the* CONNECTION *between* CATARRH *and* MALIGNANT FEVERS; *together with Conjectures on the Theory of Fever: Communicated in a Letter from* NOAH WEBSTER, Esq. *to Dr.* MILLER, *dated New-Haven, September* 28, 1803.

DEAR SIR,

IN a conversation with you, a few months ago, I mentioned some facts illustrative of the doctrines advanced in my History of Pestilential Diseases, respecting the close connection between severe catarrhal complaints and fevers of a malignant character. Imperfect as our observations on this subject have yet been, they afford much light on the history of diseases which are epidemic and pestilential; and they promise much fruit to the industrious investigator of facts and principles. If you deem the following facts and remarks useful, and calculated to afford further light on the subject, you are at liberty to commit them to your valuable Repository.

I have for many years heard the members of our House of Representatives complain, during the session of the legislature, of contracting obstinate *colds*. Without examining the fact with a philosophical eye, I had adopted the common opinion, that this effect was produced by a sudden transition from a heated room to the colder air of the open atmosphere. Nor did I ever suspect the fallacy of this opinion, until severe expe-

rience led me to investigate the subject with more care. In 1802, I contracted an obstinate catarrh during my attendance in the legislature at Hartford. Upon the application of my usual remedies, the disease yielded, and discharges of well digested mucus from the head indicated a state of convalescence. But not willing, and indeed unable to leave public business, I continued to attend daily in the House of Representatives, and soon found the relief obtained to be temporary; the disease recurred with its former severity; nor was it subdued, but by the continued effect of heat in June, for three or four weeks after the close of the session. This complaint I ascribed to the weather, the whole month of May having been very rainy, and my feet frequently damp.

During the session at New-Haven, in October following, the same cause did not exist; the weather was generally dry; but, in a few days after the commencement of the session, the catarrh seized me. Nature made great efforts to throw off the load of obstructed secretions, and, at first, with some effect; but at last yielded to the operation of the morbid cause; the mucous membrane was wholly obstructed and rendered inert, and my head seemed as if made fast with cords. This catarrh continued for some weeks, and, finally, occasioned an inflammation in my eyes, from the effects of which I have not yet recovered.

Finding, by the incessant coughing in the house, and by inquiry, that great numbers of the members were affected nearly in the same manner, and knowing that my own complaint could not be ascribed to any transition from a warm to a cold air, as I had carefully guarded myself from any such effect, I began to be convinced that the catarrhal affection must be ascribed to the destruction of oxygene, and the superabundance of azotic air, combined perhaps with some portion of perspirable matter, excreted from the bodies of men, crowded into an apartment too small for them to sit with tolerable convenience. From the facts within my own observation, and from information derived from various sources, I have become satisfied that this opinion is correct.

This effect corresponds with the observation, that catarrh often introduces an attack of violent and malignant fever. It is enumerated among the affections which accompanied the dysentery, among the repackers of beef and pork in New-York in 1799, supposed to be induced by the noxious gas extricated from putrefying meat. (Med. Repos. vol. iii. p. 310.) A few years ago, a member of the House of Representatives,

in Connecticut, was seized with a chill, while sitting in a crowded house, retired immediately, and died of a malignant fever in a few days. Is it not rational to suppose the debility which induced the chill, and the subsequent disease, were occasioned by breathing air deprived of its vital principle? And does not this fact, with many others of analogous character, afford a clue to unravel the mystery of the fatal disease at the Oxford assizes in 1577? Stowe, who relates the fact, mentions, that a "damp arose" which almost smothered the people, "very few escaped that were not taken at that instant—the jurors died presently, and shortly after, Sir Robert Bell, Lord Chief Baron, &c." More than five hundred persons died between the sixth of July and twelfth of August; but it is expressly affirmed, that the disease exhibited no infection. If the court was held in a room with a floor in it, which is probable, no vapour could have been evolved from the earth beneath, to occasion this effect. But from the number of persons who died, we may, and ought to suppose the court-room to have been crowded with spectators. This conjecture receives strength from the consideration, that this was a trial of one Jenks, for "his seditious tongue"—a trial, doubtless, very interesting to the populace. To add probability to my conjectures, it should be considered, that at the period mentioned, the Gothic mode of building prevailed in England—the ceilings were low, and the windows few, small, and very high in the wall, so as to admit no considerable current of air.* Such houses must have been very favourable to the generation of disease, as well as to the accumulation of morbid miasm; for it was impossible to ventilate them. If we suppose an apartment of this construction, to be crowded with people for several hours, in July or August, without a possibility of receiving fresh air, in any considerable quantity, I see no reason to distinguish this case from that of the black hole at Calcutta. Indeed, we should judge, *a priori*, upon chemical principles, that the obstruction of the oxygenous principle, to support such a number of persons, must necessarily produce the effect of

* I do not remember to have seen any particular mention of this mode of building among the causes of generating and rendering more common, all kinds of pestilential distempers in former centuries than in the last. Yet, probably, this ought to be enumerated among the most influential causes. I remember some old houses of this construction in this country; the ceiling so low, that a tall man could scarcely stand upright in the rooms; the windows formed with glass, in small panes, of a rhombic figure, set in lead, the leaves swinging on hinges like doors; very small, and so high, that a person must be nearly full grown to look out when standing on his feet.

rendering the remaining air unfit to maintain the vital functions. This case then may be considered as a *local pestilence suddenly induced*, but ceasing with the destruction of the persons who had imbibed the air of the room.

Let us compare these facts and conjectures with the phenomena of pestilence in our cities. Is it not true, that catarrhal affections are always prevalent in seasons when autumnal fever assumes a pestilential malignancy? I recollect the fact in 1798; the citizens of New-York, after their return to the city in November, were severely affected by the influenza. The present year I was in New-York in the month of June, and was affected with a catarrhal complaint; and a friend of mine informed me, that of seven passengers with him from Georgia, *three* of them were confined with a like complaint, within five days after their arrival in New-York. Is not this state of the atmosphere the same as that which induces the malignant fever, but existing in a smaller degree, or operating with less force before and after the epidemic? That such is the fact, seems to be indicated by the close connection of these diseases, especially in tropical countries. The fatal bilious plague at Barbadoes, in 1738, described by Warren, was introduced by catarrh and suffocating coughs, and the speedy invasion of this, as well as of the Asiatic plague, after a severe and general attack of influenza, seems to leave no room to question that both proceed from the same cause. (See the list of these diseases in my vol. ii. p. 346.) This doctrine is confirmed by the fact, that the fatal epidemic pleurisies, and other inflammatory fevers, which have so often desolated particular towns in America in winter, and been considered as infectious, usually have been introduced by the influenza. Such was the fact at Fairfield, in Connecticut, and Dover, in New-Hampshire, in 1697—8; at Springfield, in 1733; at Bethlem and New-Haven, in 1760—61. So remarkable has been this coincidence within the period in which I am able to collect accurate information, that I am inclined to believe, though I dare not assert, the influenza to have prevailed in other years, in connection with this deadly pleurisy, though I have no account of its prevalence.

It is remarkable also, that although this species of pleurisy is far less common in our old settlements for the last forty years, yet it has appeared in our new settlements, and in close connection with the influenza. An instance happened the last winter at Otsego, on the lake of that name, where Cooper's-town lost a number of robust men. This fact, with the more

common prevalence of this winter's disease, in the southern states, and on low grounds, leads me to suspect, that marsh miasms have some effect in summer, in rendering the body susceptible of its attacks.

The ideas here suggested do not accord with what I have written on the subject in my second volume of the History of Diseases; where, pursuing the opinion of Brown, that catarrh is a disease of sthenic or inflammatory diathesis, I have supposed the cause to be some stimulant quality. But theories I reject, unless founded on fact. We are at liberty to frame conjectures, provided they are offered to the world only as conjectures.

Of the causes of influenza and other epidemics we are yet ignorant; but the opinion of some of the ancients, that the atmosphere is, at times, impregnated with some morbid agent from the earth, gains more and more strength in my mind. It is not, however, the ancients alone who are my authorities. The modern medical writers in Italy and the West-Indies have noticed an unusual number of violent diseases after earthquakes. The influenza in Europe, the last spring, was preceded a few months, by a great concussion of the eastern part of Europe, and an eruption of Etna, as the public prints inform us; and, according to the natural order of diseases, we may expect to hear of anginas and malignant fevers in Europe, with the plague in Egypt and Asia.

The earth, like other bodies, is known to contain large quantities of air, which, in many places, is tainted with properties derived from mineral substances, highly pernicious to health. The air contained in the earth is pressed with the whole weight of the superincumbent atmosphere. Suppose this weight to be removed, would not that elastic fluid rush forth in great quantities, and with immense violence? But is not a portion of that weight taken off by the attraction of the moon, or other heavenly bodies, in certain periods of their several revolutions? Do not earthquakes happen mostly at four several periods, when the moon is in her apogee or perigee; or at the full or change, when she exerts the greatest power upon the earth? Of this fact, which Pliny has noticed upon the authority of the Chaldean astronomers, I have given examples sufficient to prove the point beyond controversy.*

It is very possible, not to say probable, that by the variations in the pressure of the atmosphere, or by some force within

* Plin. Lib. ii. Cap. lxxix. Hist. Pest. vol. ii. p. 291.

the earth, considerable quantities of air are, at times, extricated from the earth, either accompanied with a convulsion, or in an imperceptible manner. These discharges of air may bring forth an unusual quantity of carbonic acid gas, or other kind of fluid, in an aëriform state, not sufficient to induce disease immediately, but by a slow operation. The facts in support of this conjecture are innumerable. (See the instance related, Hist. Pest. vol. i. p. 343, with many in the second volume, Sec. 15.) And the instances of fatal fevers after earthquakes, in Italy and the West-Indies, as also in South-America, related by medical authors of the first reputation, go far toward confirming this doctrine. To exhibit demonstration on this subject may not be practicable. No chemical process has yet been devised to decompose a given portion of air, so as to exhibit its constituent elements to the senses. Such a process seems to be necessary to detect the noxious agent which occasions disease. The eudiometers hitherto invented are confessedly imperfect instruments for the purpose intended; and none of them, perhaps, calculated to detect the species of gas most efficient in the combination of air which is found to be insalubrious. That such gasses, however, are infused into the air and ocean from subterraneous regions, is rendered extremely probable by the sudden extinction of the fish in the ocean and rivers, over extensive tracts of water, as well as by epidemic diseases among brutes. On this subject I have little to add to what is contained in my history. The instance, however, of the destruction of vast numbers of fish on the Carolina coast, two or three years ago, with the prevalence of malignant fever to an unusual degree on the adjacent shores, is a new fact which you will recollect.

That the epidemic sickness, occasioned by the infusion of such a gas into the air, should not be immediately consequent on the contamination, may be very naturally explained by analogous facts. It is now well known and admitted, that marsh effluvia are imbibed often five or six months before they produce any sensible effect on the human body. Persons, leaving an atmosphere where no intermitting fever is ever engendered, and visiting some parts of the southern states, or the vicinity of the northern lakes, during the prevalence of that disease in autumn, returning home, remain in perfect health during that season and through the following winter, but the next spring are seized with intermitting fever. Instances of this kind are so frequent as to excite no surprize. In this case, the morbid cause acts slowly upon the constitution, gradually inducing that species of debility which precedes the disease. In the same manner,

anoxious gas, extricated from the earth during an earthquake, in October, 1802, may exhibit its effects in the influenza of the following spring, as may perhaps have been the case in Europe. The present state of our knowledge permits us only to offer conjectures on this interesting subject. Within two years past, we have had, in the United States, five or six slight shocks of earthquakes; yet we have not sufficient evidence that the influenza, measles, and scarlatina, since prevalent, are to be ascribed to that cause. Yet, as catarrh seems to be the first sensible effect of the morbid agent upon the body, this may be the clue to guide our researches after the cause. Now it is certain, that the air of any great city will, in its ordinary state, induce that affection on a stranger, upon his first arrival, at least in a slight degree. That air must be vitiated by a variety of means, such as gasses from disorganized animal and vegetable substances, and the excretions from the human body; by which means it contains a smaller proportion of oxygene than is necessary to support healthy life. The constant residents in cities are not sensible of the condition of the air, for the human body is furnished with the power of accommodating itself in a wonderful manner to the state of the surrounding elements. Yet to the constant imperceptible operation of these morbid causes must be ascribed the early decay of the powers of the body, and the abridgment of human life, in all large cities, which are demonstrated by the bills of mortality. These ordinary causes of disease in cities seem, at certain intervals, to be augmented by some deleterious agent, which occasions epidemic diseases in the country, or by seasons peculiarly insalubrious. Hence, epidemic measles, and scarlatina anginosa first show themselves in large cities. In the two last periods they have appeared in New-York and Philadelphia several months before they have in the country. This fact, it is presumable, may be accounted for, by supposing the *general* noxious agent in the atmosphere to be of equal force in town and country, but the power of *local* causes to be greater in towns. Since, however, the influenza, measles, and scarlet fever, invade equally the town and the country, how should it happen that the subsequent autumnal diseases, when epidemic, take the form of dysentery in the country, and of malignant bilious fever in cities? This seems to be a general law of diseases in our country: and the fact presents another difficulty, which cannot be removed without a further knowledge of the morbid causes.

If catarrh is admitted to be a common precursor of fever,

and often the first symptom of its invasion, does not the fact lead to plausible conjectures concerning the remote and proximate cause? You will pardon my intrusion into the proper business of medical gentlemen; my opinions are offered as conjectures only.

Catarrh is first perceived in the mucous membrane, the part most exposed to the action of the air in respiration. Hence we may conclude, that the noxious agent is in the atmosphere; at least this appears to be good logic. As the first effect perceived is an obstruction of the natural excretions, is it not rational to suppose the cause to be some debilitating agent, operating actively, or the want of some stimulating power, operating negatively, to render the glands languid or inert?

The theory of fever is not well settled: suppose we attempt to explain it on mechanical principles, taking, as the basis of our reasoning, Crawford's Theory of Respiration. If life is supported, and heat communicated to the body, by the decomposition of air in the lungs, and the union of the oxygen, or vital principle, with the blood, the generation of heat in the body must be nearly uniform and constant. To render this theory complete, we must admit an equally regular loss of heat, which must leave the body as fast as it is generated. By what means is this effected? Chiefly by the secretions and excretions. Fluids are the natural conductors of heat, and the body is, in every part, furnished with suitable ducts for conveying off fluids. Here we may find the final cause of the secretory and excretory system; for heat is necessary to support action, life, and vigour, not only in the viscera, but in the surface and extremities of the body; and it being necessary for life and health, that heat should be diffused to every part of the body, it becomes necessary, as a consequence, that the ducts to convey off this heat, as fast as it is renewed, to prevent an undue accumulation, or fever, should be spread over the whole surface to every extremity of the body; and equally necessary is it that this heat should be accommodated with a suitable conductor. This conductor is any fluid substance, especially water or aqueous particles. The lungs receive the air, and decompose it, extricating the oxygenous part; the blood receives and communicates the heat to every part of the body; and the excretions carry it off, chiefly through the perspiratory ducts.

According to these principles, whatever interrupts the regular passage of heat from the body must occasion a preternatural accumulation of it in some part, or in the whole sys-

tem, and this accumulation of heat is *fever*. This fever must, from the nature of heat, which is to excite action, be followed by a preternatural excitement of the heart and arteries. The heat is diffused over the skin, as well as through the viscera; but the skin being dry, it has no good conductor. To remove fever, therefore, it is necessary to remove the obstructions which prevent the escape of the perspirable fluid. How is this done? First, by bleeding. This abstracts a portion of heat in the blood taken; but its chief effect is by relaxing the vessels and skin, and thus aiding nature to renew the excretions. Secondly, copious drafts of liquids, which supply the body with the natural conductor of heat, where there was before a deficiency. Thirdly, by the application of moisture to the skin, by the bath, affusion, or fomentations; all which tend to relax the surface, and invite the escape of heat.

What is the crisis of a fever? Is it not always indicated by a restored perspiration? Then, upon these principles, the crisis is nothing more than the *first escape of a preternatural heat.* And if these principles have any just foundation, why is not the warm bath the most natural remedy for fevers? The affusion of cold water has often been tried, and sometimes with success; but this requires a force of re-action in the system that cannot often be expected when all the ducts perhaps are clogged with viscid matter. I have heard a gentleman say he had been affected with yellow fever three times, and cured in three different modes; but the last, and by far the easiest, was by the warm bath, being laid in warm water till the skin became moist, then taken out, but immersed again as soon as his skin became dry. In this way he was left without fever in a few hours.

It is common, this autumn, for our physicians to use the warm bath for dysentery; and the success, I understand, is unequivocal. It is said the warm water takes off the spasm. How? By relaxing the skin, opening the perspiratory ducts, and conveying off the preternatural heat, thus subduing the inflammation. We have been told that the application of oil to the body has been found to effect the cure of the plague. The fact is, I believe, not sufficiently ascertained; but why may we not suppose the effect of oil thus applied, to be salutary? Oil is extremely relaxing, even more so than water. It penetrates the smallest ducts, and may, perhaps, relax the skin, and open the pores more effectually than warm water; thus re-

storing, or assisting nature to restore the excretions, the natural remedy for fever.

These may be crude conjectures, and it rests with your better judgmeut to publish or suppress them.

ARTICLE VII.

Some ACCOUNT *of the* MALIGNANT FEVER *which prevailed in Philadelphia in the Autumn of the Year* 1803; *being Part of an Introductory Lecture to a Course of "Clinical Remarks, and Practical Demonstrations," in the Infirmary of the public Alms-House of Philadelphia; by* CHARLES CALDWELL, *M. D. &c. Communicated in a Letter to Dr.* MITCHILL, *dated November* 28, 1803.

A Knowledge of the histories and laws of epidemic diseases constitutes one of the most interesting and important branches in the science of medicine. You cannot, gentlemen, direct your attention to this department of your studies, either too early, or with too much zeal. A knowledge of the epidemics of your own country, in particular, cannot be acquired without much industry and labour, for it must be principally the work of your own observation. The peculiarities of our climates, seasons, state of society, habits of life, and of the general condition of our country, both physical, civil, and political, impart to the diseases of the United States new features, on which no light is shed by the writers of Europe. For your own information, therefore, as well as for the information of transatlantic physicians, who are beginning to view, with a proper regard, the medical characters and works of America, it becomes you to collect, and treasure up with assiduity and care, every thing new and interesting in the diseases which surround you, that you may be able to communicate them to the world at a future day. Considering the vast range for medical discovery and improvement, arising out of the circumstances of the country in which you reside, your time will be spent to little purpose, should you reach the meridian of literary life without making some useful contributions towards the advancement of your profession.

The malignant fever which lately prevailed in certain parts of Philadelphia excited great solicitude in the public mind, gave rise to much conjecture and controversy, and was made a sub-

ject of no common degree of misrepresentation. I shall, therefore, take the liberty of laying before you a brief and, as far as I am able, a correct statement of its rise, progress, and termination. In this sketch I shall confine myself principally to facts, and touch but lightly on the controverted doctrines of importation and domestic origin. These, however, are matters so intimately connected and interwoven with the subject, that they cannot be passed over without a degree of notice. As the disease was evidently much under atmospheric influence and controul, it will be necessary to advert to the state of the weather for some time previous to its occurrence. The state of the city, in relation to the prevalence of epidemic complaints, must also receive a due share of attention.

During the months of March and April last nothing very remarkable occurred, either in the state of the weather or in that of the health of the inhabitants of Philadelphia. The season was rather cooler than usual, with a general prevalence of northerly and easterly winds. Though clouds were frequent, and oftentimes threatening, yet the quantity of rain that descended was scarcely sufficient for the purposes of vegetation. Owing to this, and the low temperature of the atmosphere, the early labours of the husbandman were scantily rewarded, and our markets but indifferently supplied with vegetables. During this period, the cow-pox and small-pox, both natural and inoculated, proved very mild and manageable; the common complaints of spring were neither numerous nor severe, and no epidemic whatever made its appearance. Though vegetation was checked through a deficiency of heat and moisture, yet all the elements were at peace with man.

Throughout the whole of May and June, except about seven days in the course of the latter month, the weather continued unseasonably cool, the prevailing winds still preserving a northerly direction. It was not till near the close of June that the citizens were able to dispense entirely with fires in their parlours. Nor were the falls of rain during this period either frequent or copious, though clouds, particularly distant ones, accompanied by lightning and thunder, were no unusual occurrences. It is scarcely necessary to remark, that, under such a temperature and state of weather, the progress of vegetation, and the ripening of fruit, were still slow and imperfect. Animal nature, but particularly man, seemed still the favourite of the season, for he continued unusually exempt from diseases of every description. A few cases of intermitting, and some of remitting fever, and dysentery occurred, but they yielded very

readily to the common mode of treatment. At this period, even tropical climates seemed to have laid aside their wonted malignity, and become friendly to the human race. The crews of most West-India vessels entered our port in full health, and without having experienced a complaint during their voyage. Nor had we certain information of the prevalence of disease in any of the islands.

Throughout the month of July, the state of the weather, in general, was widely different from what it had been during the preceding part of the season. The cool refreshing northerly breezes of May and June were now exchanged, either for oppressive calms, or for the humid and sultry winds of the south. Such are the changes which the state and temperature of the atmosphere undergo in the islands of the Mediterranean, the West-Indies, and elsewhere, previously to the eruption of some mortal epidemic. Even in the south of Europe, a long continuance of the "*humidus australis*," during the summer or autumnal months, is a seldom-failing harbinger of some wasting disease. The history of the late malignant fever which ravaged certain provinces of Spain, furnishes evidence in confirmation of this truth; that epidemic calamity was preceded by an unusual prevalence of southerly winds.

Under such heats, the citizens began to complain of languor and debility, and vegetation, as if rejoicing in an atmosphere unfriendly to animal life, became more luxuriant. During this month, the mercury in Fahrenheit's thermometer was seldom below 80 degrees, for several hours in the day, and sometimes rose to 90 degrees and upwards. This temperature, concurring with cloudy weather, and frequent falls of rain, (some of them very profuse) gave us a state of atmosphere perfectly tropical. Privies, sewers, and other reservoirs of filth, emitted a smell more than usually offensive. From the joint effect of these considerations, apprehensions began to be entertained, that our late scenes of health must soon close for the season. Accordingly, on the nineteenth of the month (July), two cases of disease occurred in adjoining houses, at the corner of Chesnut and Water-streets, which were but too well calculated to realize and confirm these melancholy anticipations. It will be held in remembrance, as a fact of much consequence, relative to a point which we shall presently endeavour to establish, that, at this time, we had no account of the prevalence of malignant fever in the city of New-York; nor is there any reason to believe that it had made its appearance there more than two days previously to the occurrence of the foregoing cases. The

seventeenth of July appears to be the earliest date to which the late fever of that city has been traced. I think the proclamation of the Mayor extended no further back than to the twentieth.

The two persons who sickened at the corner of Chesnut and Water streets were females, under the age of sixteen years. One of them died on the fifth day of her illness, and the other recovered; but they both exhibited unequivocal symptoms of malignant fever. It is worthy of remark, that adjoining to the houses where these persons resided, were a yard and private alley, containing stagnant water and putrid substances, which, for a week or ten days previously, had emitted a smell highly offensive to the neighbourhood. The families where the sickness occurred did not hesitate to attribute their misfortune to this insufferable stench. The physicians who attended these two cases of disease entertain, or at least profess a belief, that malignant (commonly called yellow) fever, can arise only from contagion. But, after searching for the West-India vessels, diseased sailors, trunks of clothing that had passed between the *thirty-second degree of north, and the same degree of south latitude*;* and being unable to discover, in the vicinity, either such sources, or any other fomes whatever, they very prudently declined giving a decided opinion on the nature of the disease, lest they might injure the doctrine they had pledged themselves to support. By such disingenuous artifices is error suffered to hold an ascendency over truth!

From the twenty-eighth of July, till the fifth or sixth of August, four other cases of malignant fever appeared in the same neighbourhood, three of which terminated fatally. It is particularly worthy of notice, that the persons here attacked never had the slightest intercourse with each other, nor with any common source, except the atmosphere of the place where they resided. A knowledge of this induced most of the citizens to consider their disease as nothing else than a high grade of autumnal fever, or what was afterwards very emphatically denominated the *Water-street fever*. It is remarkable that this name was bestowed on the disease by a physician who is *ostensibly* an *orthodox importer*. But it is among the misfortunes of the time, that we have *hypocrites* in *medicine* as well

* By a late health-law for the city and port of Philadelphia, the leading features of which were sketched by the college of physicians, every vessel coming from a port or place between the *thirty-second degree of north, and the same degree of south latitude*, during the summer and autumnal months, was considered as infected, and condemned to a quarantine of fifteen days.

as in *religion.* After the termination of the last of these cases, the disease died away, and was no more heard of in that part of the city for several weeks.

But the neighbourhood of Chesnut and Water streets was not the only place where malignant fever existed at this time. A very decided case made its appearance in the person of a Mrs. Cole, on the twenty-third, and terminated in death on the twenty-seventh of July. This woman resided in Water, near to South-street, upwards of a quarter of a mile from the former situation, and had not been out of her own neighbourhood for several weeks previously to her illness. On her death the disease made a pause, and did not recommence its ravages in that part of the city till about the close of the succeeding month.

There existed still another point, where malignant fever threatened at the same time to attack us. This was in Water, near to Race-street, about a quarter of a mile in an opposite direction from Chesnut-street, and more than twice that distance from South-street. Mr. Jolly, of that neighbourhood, sickened on the twenty-eighth, and died on the thirty-first of July, with symptoms of high malignity. Between the first and tenth of August, six other persons in the same neighbourhood, but who had no intercourse with each other, were attacked by the same disease, one of whom died on the fourth day of his illness. The others all recovered, and no more new cases occurring in the vicinity, tranquillity soon succeeded to the temporary disquietude which the minds of the citizens had lately experienced.

Thus were there at least three points in the city, distant and disconnected from each other, where malignant fever made its appearance within nine days of the same time. Nor had the inhabitants of these places the smallest degree of mutual intercourse. Most of them were unknown to each other even by name. At this period, so circumscribed was the fever in New-York, that we were apprized of its very existence only through the medium of popular rumour. As yet all parts of Philadelphia, except Water-street, which must be regarded as the *low ground* of the river Delaware, enjoyed an unusual exemption from disease. We must here remark, that during last autumn, the *low grounds* of most large rivers in the United States were subject to *malignant fever.* Along the banks of the Susquehannah, the ravages of this disease were melancholy and unprecedented. In some instances it hurried *whole families* to the grave, an event which did not, during the season, occur in Philadelphia.

On the twelfth of August we had a heavy fall of rain, which

was succeeded by a remarkable change in the temperature of the atmosphere, the mercury sinking upwards of ten degrees. From this, till the twenty-second of the month, there was a prevalence of northerly winds, accompanied by weather cool and serene. During this interval of ten days, the city remained free from any further cases of malignant disease, and the public mind retained its tranquillity. The attention and sympathy of the citizens were now directed wholly towards New-York, where the calamities of pestilence appeared to be daily increasing. Having discarded, in a great measure, all apprehension as to their own fate during the remainder of the season, they felt more acutely for the distresses of their neighbours.

On the twenty-third of August the wind shifted to the southward, and the atmosphere became humid, warm, and oppressive. This change was viewed by many with deep regret, as the precursor of further sickness and alarm. Nor was it long before their apprehensions were confirmed. On the morning of the twenty-fifth of the month, a dreadful fire broke out in Water, near Market-street, which, as is usual on such occurrences, drew together a vast concourse of people. Of these, some were engaged in violent exercise, while others were standing idle in the streets, on the tops of houses, or at windows, many of them only partially dressed. Such a scene was well calculated to act as the exciting cause of disease. Accordingly, in the course of the two or three succeeding days, eight or nine persons, immediately adjacent to where the fire had raged, were attacked by malignant fever. It deserves to be remembered, however, that not one sickened who had not been more or less exposed at the fire. Nor is it less worthy of notice, that these persons had not previously had any mutual intercourse, except, perhaps, by passing each other in the street. The disease appeared suddenly, and nearly at once in five or six families, the individuals of which had probably never exchanged a visit, or even a word either of business or ceremony. From this time the number of the sick continued daily to increase, and the state of the neighbourhood to become more and more alarming. But this was not all. During the first week of September, the disease renewed its attack in all those neighbourhoods where it had made its appearance in preceding parts of the season. Indeed, there were now scattering cases of it in most parts of Water-street, between Race and Almond streets, a distance of somewhat more than a mile. But the district, extending from Market to Walnut-street, and from the east side of Front-street to the river Delaware, constituted the prin-

cipal theatre of its ravages. With such violence did it rage within these limits, that, on the twelfth of the month, the Board of Health thought it right to advise the inhabitants to remove, and to interdict all unnecessary intercourse with the sickly neighbourhood. Owing, however, to the advanced period of the season, and the favourable state of the atmosphere, the weather being then cool and pleasant, they dissuaded their fellow citizens from a general removal. Nor, though rendered by that act the object of malicious invective and unfounded calumny, have they since found cause to repent of their advice. They possess a proud consciousness, of which the apostles of defamation can never deprive them, that their motives were pure and upright, and a thorough conviction, that their measures were beneficial to the interests of Philadelphia.

Throughout the remainder of the month of September, and till near the close of the first week in October, the disease continued, by feeble efforts, to advance slowly from the low ground of the river towards the more elevated parts of the city. Except, however, in alleys, and other filthy places inhabited by the poor, it did not make its way across Second-street, nor did it, save in a few places, advance even so far. It may be confidently asserted, that that portion of Philadelphia which lies to the westward of Second-street never enjoyed a higher exemption from disease than during the late season. As the fever receded from the low ground and malignant atmosphere of Water-street, it became more and more mild and manageable, till its evanescent shades in Second-street were, in many instances, much lighter than the common remittent of the country. My own family furnished ample testimony of the truth of this remark. Five persons in my house were attacked in the course of two days by the prevailing complaint; but so slightly were they affected, that the aggregate amount of all their indispositions was not equal to one severe case of common autumnal fever.

After the tenth of October the disease was no longer spoken of as a thing dangerous or alarming, and before the twentieth there was scarcely a case of it existing in the city. Contrary to the experience of former years, and contrary to the tenets of certain physicians on the subject, it terminated entirely before the occurrence, and consequently before the *contagion-killing* power of black frost.

However foreign it may be from my intention and express declaration to enter deeply, on the present occasion, into the controverted doctrines of *contagion* or *non-contagion*, *impor-*

tation or *domestic origin*, I conceive it a duty which I owe to truth, to my country, and to mankind, to draw from the preceding narrative a few of the most natural and striking inferences relative to these points.

As it has never been alleged by any one, that the malignant fever of last season was introduced into Philadelphia from the West-Indies through the channel of commerce, and as there did not exist even a shadow of ground for such a suspicion, it would be superfluous to consume time in the discussion of that head of my subject. Those who considered it as an evil, necessarily of extraneous birth, looked to New-York alone as the immediate source of our misfortune. Though facts were daily occurring to convince them that the disease could not, by any mode of communication, be transplanted from Water-street even to Third-street, they still contended, that it had been conveyed from New-York to this place, either by land, by water, or perhaps on the wings of the easterly wind. It is presumed, that the following considerations will fully and satisfactorily expose the fallacy of such an opinion.

First. The malignant fever appeared in New-York on the seventeenth, and in Philadelphia on the nineteenth of July. But it is scarcely probable, that any one can be so wild and extravagant, not to say absurd, in his notions, as to suppose, that contagion can be conveyed from New-York, and communicated, and even produce its effects in Philadelphia in the short space of two days. An opinion, like this, could not be regarded otherwise than with ridicule, even by the most decided, zealous, and weak contagionist. Besides the time requisite for its transportation from New-York, febrile poison seems necessarily to require several days to produce, in the system, a general disease.

Secondly. The persons who were first attacked by malignant fever, near the corner of Chesnut and Water streets, had not, for weeks previously, had the slightest intercourse with any person or article recently from New-York. The same thing may be affirmed respecting Mrs. Cole, who sickened and died near South-street, as well as respecting Mr. Jolly, and the others who were, about the same time, attacked in the neighbourhood of Race-street. It could not be ascertained, on the most rigid inquiry, that even one of these persons had been exposed to any source suspected of contagion. Indeed, no such source was discoverable in their neighbourhoods.

Thirdly. When the disease made its appearance, about the twenty-sixth of August, at the corner of Market and Water

streets, the contagionists began to triumph, in a belief that they would be able to trace it to an immediate intercourse with New-York. A prompt investigation of the subject, however, by those on the opposite side of the question, soon checked their triumph, and completely blasted their fairest hopes. To the misfortune and confusion of these gentlemen, the shades of night do not vanish more precipitately or certainly on the approach of the sun, than their dreams of importation recede from the touch of rigid inquiry. Their frightful accounts of contagion, issuing from the bodies of the sick and dead, like stories of witches, ghosts, and goblins, are well received by the credulous and "wonder-wounded" multitude; but the medical philosopher, who examines for himself, and spurns the trammels of prejudice from his reason and his senses, cannot fail to reject them as unfounded and fabulous. The following brief statement will show on what a cobweb foundation the contagionists were willing, during the late season, to erect their doctrine.

Mr. Brinley, late from Boston, was among the first persons who sickened in Water, near Market-street. He happened to be the only stranger indisposed in that neighbourhood. It was immediately suspected, (perhaps I ought to have said pretended to be suspected) by some advocates for contagion, and soon afterwards positively asserted by others, that this gentleman had, on his passage from Boston to Philadelphia, touched at New-York; that he had there received the infection of malignant fever, and, on his arrival, disseminated it through the families adjacent to his lodging. Such was, in a short time, the currency and credit of this story, that it became a new article in the creed of contagionists, gained admission into the public prints, and misled, for a while, a great proportion of our citizens. There existed, however, at the same time, a single fact, known to every one who was industrious enough to inquire for himself, which took from this account of the origin of our disease every vestige of probability. Mr. Brinley was only one of the seven or eight persons who sickened in the neighbourhood within less than forty-eight hours of the same time. With none of these had he ever had the smallest intercourse, except one or two who lived in the same house with himself. Being an entire stranger, he had no communication whatever with the neighbouring families. It is not possible then, that he could, in a few hours after sickening, infect persons through the walls of the surrounding houses, some of them distant at least forty yards.

But, to prove beyond controversy, that Mr. Brinley did not introduce disease into Philadelphia, I am in possession of two respectable affidavits, and a certificate equally valid, setting forth, that he continued in perfect health for three weeks after his arrival among us, and that he had not, during his passage from Boston, touched either at New-York or elsewhere. The vessel in which he came a passenger never made land from the time she lost sight of Cape-Cod till she arrived near the mouth of Delaware bay; nor was there on board of her a single article that had been in any place where sickness prevailed.

Fourthly. It has been clearly proven, as far as a negative proposition is capable of proof, that the late fever of New-York could not be propagated in Newark, Brunswick, Amboy, nor any of the neighbouring towns or villages, though thousands of the citizens removed thither, *many of them* actually *labouring under the disease.* How, then, could it be conveyed ten times the distance by *one person in health,* and propagated with such rapidity in the city of Philadelphia? The very supposition of events so opposite and contradictory carries on its face its own refutation, and ought to throw a blush over the faces of those who engage in its support. But our physicians who deal in importation, write and talk for the *multitude alone,* on whose easy credulity they too frequently palm absurdities the most gross and palpable.

The *contagious nature* of the late malignant fever of *Philadelphia* is, as on former occasions, a subject which has exercised the public mind, and divided public opinion. While some assert that it was communicated like the small-pox, from person to person, by means of secreted contagion, others contend that it spread only through the medium of a vitiated atmosphere, in like manner with the autumnal diseases of the country. A few words on this head shall close the present address.

Let us first briefly inquire, What is meant by a contagious disease? or what is the true import of the word contagion? Is a disease to be deemed contagious only because, at a *particular season* of the year, and in *particular situations,* it spreads through families, neighbourhoods, towns, and districts of country, but does not pervade them in different situations, or at other seasons? If so, the intermitting and remitting fevers of the United States are highly contagious, because, in the autumnal season, along the flats of large rivers, and in other low marshy places, their spread is frequently both rapid and exten-

sive. If so, even our common catarrhs are contagious, for on a sudden change of weather they oftentimes overrun families, neighbourhoods, and villages. But I presume that an idea very different from this is meant to be conveyed by the word contagion.

If to the term *contagious disease* we annex any definite meaning at all, it must be that of a disease possessing within itself a power or principle of *self-propagation*. This power, or principle, must be capable of producing its specific effect, independently of all extraneous aid, whether from season, climate, soil, or situation. If a disease cannot spread independently of the assistance of a particular state of season, climate, and situation, it is unwarrantable and absurd to pronounce it contagious. Under such circumstances, as well might the season, climate, or situation be denominated contagious as the disease, the concurrence of all of them being essential to its propagation.

Perhaps we have in small-pox the only specimen that nosology affords, of a febrile disease being *unequivocally* contagious. That specific and independent complaint, like an *electron per se*, neither derives aid from, nor does homage to extraneous circumstances of any description. Such are its intrinsic powers of self-propagation, that it makes all states and conditions, whether of climate, season, or situation, bow to its controul. Perennial both in its existence and action, the spring and the autumn, the summer and the winter, witness alike the sufferings of its victims. So indestructible is its nature, and so boundless its extent, that neither the city nor the country, the hill nor the valley, the fervors of the torrid, nor the snows of the frigid zone, can furnish a secure asylum from its ravages. It communicates from the sick to the well as readily in the pure empyreal air of the mountain, as amid the "putrid thaw and exhalations rank" of the crowded city.

But how widely different from these were all the circumstances and phenomena connected with the propagation of our late malignant fever! That disease was capable of spreading through families only in Water, Front, and certain parts of Second-street. When cases of it were removed a little further to the westward, they terminated without being suspected of injuring any one. Nor was this all; for it was no less circumscribed in point of *time* than of situation. It ceased to spread even in the atmosphere of Water-street, before the occurrence of cold weather. After the tenth, or middle of October, the word *contagion* was robbed of its terrors.

Shall we say then, that the disease was contagious in Water and Front streets, but not so in any degree to the westward of Second-street? Shall we declare that it possessed a power of self-propagation in September, but lost that power early in the month of October? Or shall we adopt a favourite and common-place expression of certain learned gentlemen, and pronounce it to be only "*conditionally contagious?*" In adopting either branch of the dilemma, we would commit an absurdity that ought to suffuse with a blush the cheek of the youngest pupil in medicine.

The removal of a case of disease from Water to Third-street, though it may affect some of its symptoms, cannot possibly change its specific nature. If in the former situation the human system, under its influence, possessed a power of secreting a febrile poison, what is there in the latter to deprive it of such a power? Can the contagious nature of small-pox be destroyed by removing a person labouring under it from one square of the city to another? Is not the variolous poison secreted alike under every description of situation and atmosphere with which we are acquainted? But, say our firm and zealous apostles of contagion, "the air in the higher streets of Philadelphia was too pure, during the late season, to serve as a vehicle for the contagion of malignant fever. A seed, continue they, will not vegetate unless it be planted in a proper soil. A plant will wither if placed on the surface of a barren rock. The air of Water-street was the proper soil for the seed of our late malignant disease, where it grew and spread with luxuriance and rapidity. When removed to the atmosphere of streets more elevated and remote from the river, it perished for want of kindred nutriment."—The answer to this reasoning (if indeed it deserve the name of reasoning), is obvious and easy. To acknowledge that a disease is contagious only when aided by the action of a contaminated atmosphere, is an actual abandonment of the doctrine of contagion altogether. It is a plain declaration, that the disease is contagious only in part, which amounts to the same thing as not to be contagious at all. For, to be really contagious, it must, as already observed, possess an independent power of self-propagation. If it be destitute of such a power, avoid an impure atmosphere, and health will not be endangered by it. Take the proper steps to depurate the surrounding element, and, like the serpent rifled of his venom, the disease is deprived of all its terrors. Dr. Rush very justly remarks, that there are no half-truths in medicine. As well may we speak of a seed *half prolific*, an ani-

mal *half alive*, or oxyd of arsenic *half poisonous*, as of a disease *half or partially contagious*.

In the instance under consideration, the contagionists betray the most consummate weakness, and even concede to their antagonists every thing for which they contend. They fairly admit, that our malignant diseases of autumn are propagated only through the instrumentality of putrid exhalations. They proclaim, in language no less emphatic and definitive than that of their antagonists; let us purge our towns, villages, and habitations of all impurities; let us remove from around us whatever can vitiate the element which we breathe; and let us live in all respects conformably to the nature and genius of the climate we inhabit, and the disease called yellow fever will cease to be the scourge and terror of our country.

REVIEW.

ART. I. *Elements of Botany, &c. By* Benjamin Smith Barton, M. D. *&c.*

[Concluded from page 64.]

SOME further remarks were promised to our readers on this elementary work of the Pennsylvanian Professor. After bestowing due eulogium on this performance in our last number, a few friendly strictures were added, for omitting to place before the students of Botany a table of contents, or, at least, an index.

We now continue our review, by taking up the second part, which treats on vegetable physiology. Here we hoped to find as ample a treatise as the design of the work would permit, on the structure and functions of plants. We entered upon it, and read with pleasure a section on the anatomy of vegetable trunks or timber; and another on the vessels or tubes for the circulation and distribution of sap and other fluids through plants; when, behold, to our great surprise and disappointment, we were at the end of it! On turning back to the preface, we found that the author's original intention of giving a general view of the leading subjects in vegetable physiology had been deserted. The reason given for this is, that he had suffered himself to be drawn into an extent of discussion which he had but little contemplated. Finding, therefore, that the whole of what he had written could not be comprised in the present volume, he has reserved by far the greater part of it for a supplementary publication. And, in this manner, he proposes to make peace with his readers for the present deficiency and imperfection. This body of additional matter will be published as soon as his health and other circumstances will permit, in a book of about one hundred and sixty pages, with a few necessary engraved prints.

It does not appear to a critic, that there was any need of this *hiatus in opere*. The first part, containing the botanical description of vegetables, and the third, treating of their methodical disposition, or classification into system, would have made an ample and entire elementary treatise, without having this fragment of another volume thrust in between. If this little

portion, no larger than a very moderate pamphlet, had been kept with the rest of the manuscript to which it belongs, there would have been no breach or interruption in the volume before us; but the reader, after due preparation in the descriptive part, would have passed on easily and naturally to the classification and arrangement. What is now improperly called the third part, would then have received the proper appellation of the second; and then the learned author might have continued to publish, at his leisure, afterwards, as many great and good men have done before him, and given to the world, in an entire form, his account of the structure and functions of plants, as philosophically, and as much in detail as he pleased. This might have been called a second volume, or it might have been a distinct work; or, if Dr. Barton should still prefer the name, it might even then be a "Supplement to the Elements." In our judgment, these physiological considerations would be better disposed of in a book by themselves, and would constitute with much more propriety, a third, or a concluding part of the work, than in their present situation, severing subjects that have a near relation by being forced between them. With these observations we pass on, reserving what may be further needful to be remarked until the Supplement shall be published. At that time, perhaps, the two sections before us will be transplanted thither. But whether this shall be done or not, it will be in our power to recur to these few pages, and consider their merits in connection with the others to which they are allied.

Before we quit this part of the book, it becomes us to animadvert on the intricate manner of numbering its pages, as was remarked in the first paragraph of our review. There are four or five different series of pages. This is a faulty practice, defeating, in some measure, the very intention of such distinguishing marks in books. Where a work is continued regularly on one subject, beyond the extent of a single volume, correct book-makers have found out the utility of continuing the pages along without interruption to the end of the work. We could give high botanical authority for this practice, in the *Species plantarum* of Linnæus, and in the *Families of plants*, by the Litchfield Society. By this obvious method, so easy to adopt, and so convenient when adopted, are references made with the greatest ease and simplicity; whereas, in the other mode, the subject is rendered needlessly complicated and embarrassing.

The third part of Dr. B.'s book is employed in an explana-

tion of the sexual system of vegetables. It will not be necessary for us to inform our readers that this consists of twenty-four classes, nor that these classes are formed from the number, situation, proportion, connection, shape, or defect of the stamens. Such matters and others, explanatory of the manner in which the orders are formed, with other interesting particulars, must be sought for in this and other elementary treatises. But as, in the former part of our review, we mentioned that Dr. B. had given a character to each of the classes, we shall gratify both ourselves and the lovers of botany, by making an extract or two from this part of his work. We select, for this purpose, what he says on the first class. (p. 5.)

"Linnæus has not offered his Sexual System as a NATURAL SYSTEM. Nevertheless, we shall find that some of the classes of this celebrated system are *nearly* natural, and that in others various natural assemblages of plants may be found. The class of Monandria has no high claim to the character of a natural class. Indeed, it brings together vegetables of very unlike habits or appearances, and of very opposite qualities. Hippuris and Salicornia, on the one hand, are very far removed from Canna and Amomum, on the other hand.

"The class Monandria, however, contains a fine order of plants, very nearly allied to each other: I mean the *Scitamineæ*, comprehending the Renealmia, Amomum, Curcuma, Thalia, Maranta, Myrosma, Kæmpferia, Canna, Alpinia, and Costus. Several of these plants have a most agreeable and highly aromatic taste, such as the Amomum Zingiber, or Ginger, Costus Arabicus, the Kæmpferia Galanga, or Galangale, and others. Indeed, almost all these plants are more or less aromatic; and it is from this quality that they have received their name. *Scitamentum*, or *Scitum edulium*, signifies an eatable which has a racy or aromatic flavour. The Arrow-root, which is now introduced into the Materia Medica, is the produce of the Maranta arundinacea. The *Scitamineæ* constitute the eighth of Linnæus's *Ordines Naturales*, or Natural Orders.*

"The United States are far from being rich in plants of the class Monandria. Some fine species of Canna, however, are natives of this country. Salicornia, Callitriche, Blitum, and Cinna are also native genera."

We copy also his observations on the sixth class. (p. 28.)

* "Caroli a Linne, M. D. Prælectiones in Ordines Naturales Plantarum. Edidit. P. D. Giseke, M. D. p. 188—273. Hamburgi. 1792.

"The class Hexandria may, with safety, be characterized as one of the most beautiful in the sexual system. In the scale of importance, it also merits an higher place than several of the other classes. It has no inconsiderable claim to the character of a natural class. It certainly embraces some pretty extensive natural assemblages; such are those which Linnæus has thrown into the ninth and tenth orders, *Spathaceæ* and *Coronariæ*, of which I have already made mention.* The following are some of the genera which constitute Linnæus's eleventh order, or *Sarmentaceæ*:† Astroemeria, Convallaria, Dracæna, Asparagus, Gloriosa, Erythronium, Uvularia, Medeola, Trillium, and others. Linnæus asserts, that all his *Sarmentaceæ*, with the exception of two, viz. Dioscorea, which belongs to the xxii class, and Asparagus, have something malignant in their composition.‡ Gloriosa is, indeed, a very poisonous plant; and nearly the same remark may be applied to several others. But the order of which I am speaking contains several plants that appear to be entirely innocent. The young shoots of a species of Convallaria (called Wild-Asparagus) are eaten in some parts of the United States, and are deemed little inferior to Asparagus. The root of the Medeola Virginica is eaten by our Indians. This plant is called "Indian Cucumber."

"The class Hexandria has given to the Materia Medica some important or useful vegetables. Different species of Allium, particularly the Allium Sativum, or Garlick, and the Allium Porrum, or Leek, though more employed as articles of diet, are, unquestionably, possessed of very useful medical qualities. The aloes of the shops is the inspissated juice of different species of Aloe. The important diuretic, the Squill, is the bulb or root of the Scilla maritima. The bulbous root of the Colchicum autumnale, or Meadow-Saffron, is possessed of the same powers, but in a less eminent degree. I must not omit to mention the Oryza Sativa, or Rice, though this is not strictly a medicinal article. That plant alone gives to the class Hexandria a high importance. *But how greatly is it to be regretted, that this vegetable, in the most free and happy country*

* "See Part I. p. 13, and p. 117, 118.

† "I have already made mention, (see Part I. p. 22. n. 8.) of the *caulis sarmentosus*, or sarmentose stem; so called from *sarmentum*, the twig or spray of a vine. Several of the vegetables of the order Sarmentaceæ, such as Smilax, Dioscorea, Tamus, Menispermum, Cissampelos, are furnished with this species of stem: but others (I believe the greater number) have stems of another kind. The order Sarmentaceæ is far from being a very natural assemblage of vegetables.

‡ "Prælectiones, &c. p. 504.

upon earth, should be cultivated, almost exclusively, by the hands of slaves! Shall we never learn to be just to our fellow-creatures? Shall we blindly pursue the imaginary advantages of the moment, and neglect the still but solemn voice of God, until

——"Vengeance in the lurid air,
"Lifts her red arm, expos'd and bare?"

"Beside the plants which I have mentioned, it is said that Leontice Thalictroides,* and some species of Prinos possess active medical qualities. I repose no manner of confidence in the powers that have been ascribed to the bulb of Hypoxis erecta, as a remedy against the bite of the rattle-snake, and other venomous serpents.

"The United States are remarkably rich in plants of the class Hexandria."

We also give place to his remarks on the eleventh, twelfth, and thirteenth classes, as containing some good and forcible botanical criticism. (p. 48, 53, and 60.)

"The twelfth class is named DODECANDRIA.† This class contains plants with hermaphrodite flowers, which, agreeably to the name of the class, ought to have twelve stamens, or male organs. It must not, however, be supposed, that all the plants of this class have the precise number of stamens which the name imports. Several of the genera have more than twelve of these sexual organs; and some of them have even less than the implied number. Thus, Bocconia has from eight to twelve, or more; Hudsonia, from ten to fifteen, (generally ten, rarely more than twelve); Befaria, fourteen; Peganum, Nitraria, and others, fifteen; and Garcinia and Bassia, sixteen stamens. Several of the genera have nineteen stamens, and Agrimonia has from twelve to twenty. So indeterminate is the number of the stamens of this class.

"According to Linnæus, the class in question embraces those hermaphrodite vegetables whose flowers have from twelve to nineteen stamens, or male organs. But this is not the essential feature of the class Dodecandria. It seems to be the essential character of this class, that the stamens, (or, in place of them, the anthers), whatever may be their precise number, are inserted into the receptaculum, or receptacle. *By the place of insertion* we very readily distinguish the plants of the class Dodecandria from those of Icosandria;

* "A native of Pennsylvania.

† "From δωδεκα, twelve.

for in this last the stamens are inserted either into the calyx or into the petals. But it is not so easy to distinguish the plants of Dodecandria from those of Polyandria. In both, the insertion of the stamens is the same, and we shall afterwards see, that there are not a few of the plants of Polyandria which have less than nineteen, or even twelve stamens.*

"From this view of the subject, it must appear evident, that the class Dodecandria opposes a considerable difficulty to the student, in his investigation of plants, according to the principles of the sexual method. Were we to adopt the Linnæan interpretation of the class, we should rob the class Polyandria of some of its genera, and associate them with the plants of Dodecandria, with which they have much less affinity, in their general aspect, and in properties. I cannot help thinking the class Dodecandria a very exceptionable one: nor am I singular in this opinion. The learned Crantz and other writers have, long ago, entertained a similar opinion. *Would the sexual system suffer any injury by the total abolition of this class?* I think it would not. But where should we dispose of the genera which are now arranged under this class? In different classes, according to the number, insertion, &c. of the stamens. All those genera which have more than ten stamens might be thrown into the class Polyandria. See Polyandria.

"The class Dodecandria is subdivided into five orders, viz. Monogynia, Digynia, Trigynia, Pentagynia, and Dodecagynia."

"The twelfth class is denominated Icosandria.† This class embraces those hermaphrodite flowers which are furnished with twenty or more stamens, which are inserted into the calyx, or into the inner side of the petals. By this last mentioned circumstance, and not by the mere number of the stamens, is the class Icosandria distinguished from the class Polyandria, which is next to be treated of. Many Polyandrous plants are not furnished with more stamens than the plants of the class Icosandria. On the contrary, we shall afterwards see, that not a few of the genera which Linnæus has arranged in the xiiith class of his system, have constantly less than twenty stamens. Here, then, we once more enter into a region of difficulty with respect to the discrimination of the classical characters of

* "Among other writers, Dr. Martyn, (*The Language of Botany*, &c.) misleads the student, by asserting, that the class Dodecandria comprehends 'all those plants which have hermaphrodite flowers with from twelve to nineteen stamens inclusive."

† "From εἴκοσι, twenty.

the universally received system of Linnæus. How are the classes Icosandria and Polyandria to be distinguished from each other?

I have just said, that in the plants of the Icosandria, the stamens, whatever may be their number, are inserted into the calyx, or into the sides of the petals. But in the plants of the class Polyandria, the stamens are inserted into the receptaculum, or receptacle, of the flower. This is a nice and very interesting character in the discrimination of these two classes. We shall afterwards see how important, and how necessary to be attended to, it is in our endeavours to investigate the properties of Icosandrous and Polyandrous plants.

"There is still another character by which the class Icosandria may be distinguished from Polyandria. The plants of Icosandria have a concave calyx, or flower-cup, which is composed of one leaf, to the inner side of which the petals are fastened by their ungues or claws. '*To confound this class with Polyandria is abominable.**' See Polyandria.

"The class Icosandria is subdivided into five orders, viz. Monogynia, Digynia, Trigynia, Pentagynia, and Polygynia."

"The thirteenth class is denominated Polyandria.† This class embraces those hermaphrodite vegetables which are furnished with a number of stamens, that are inserted into the receptacle of the flower. I have already observed, that it is by this circumstance, though it is not expressed in the name of the class, that the Polyandrous vegetables are distinguished from those of the class Icosandria.

"With respect to the number of the stamens of this class, it is said by Linnæus, that they are generally from twenty to a thousand. It is true, that many of the plants of the class Polyandria are furnished with a very great number of stamens, far above twenty; such as Poppy, Capparis, Cistus, Ranunculus, and others. But in the class Icosandria there are not a few genera which are as abundantly supplied with these sexual organs, such as Cactus, Eugenia, Rosa, and others. By attending, however, to the very different manner of insertion of the many-stamened plants of these two classes, we shall have no difficulty in referring them to their proper classes.

"Professor Gmelin, in his edition of the *Systema Naturæ*, has united the two classes Icosandria and Polyandria into one, which retains the name of Polyandria! I cannot but consider

* "Professor Martyn.

† "From Πολυς, many.

this as a very injudicious alteration; and I am happy to unite in sentiment, on this subject, with a number of able botanists.* The classes Icosandria and Polyandria should be kept apart, and not merely in subordinate divisions, but in the higher associations, or classes. Nature is remarkably regular and constant in the place of insertion of the stamens. Besides, by uniting, or rather *confounding*, the two classes in question, we render the sexual system much more artificial than it really was, when it came from the hands of its Great Architect: we, thus, deprive it of one of its charms, its *occasional* approach to a Natural System. For although the system of Linnæus is professedly artificial, it has, certainly, some claim to the character of a natural assemblage of vegetables; and I cannot help thinking, that in proportion as it is rendered more artificial it will lose a part of its value.

"It has already been observed, that the class Icosandria contains a great number of esculent and innocent vegetables. We shall soon see, on the other hand, that the class Polyandria abounds in poisonous or active vegetables. In this respect the two assemblages are very different from each other, and this circumstance should have had some weight with rash innovators, before they made the disposition to which I have objected. In fact, the mode of insertion of the stamens in the class Icosandria is a feature of great importance. Even in other classes, a like mode of insertion sometimes gives an indication of the wholesome properties of the vegetable. This is the case with the genus Ribes, comprehending the different kinds of Currants, Gooseberries, &c. which are some of the most innocent fruits in the class Pentandria.†

"Whilst, however, I object to the melting down of the two classes Icosandria and Polyandria into one class, I confess, again, that I should have no objection to see the last of these classes, in some measure, blended with the class Dodecandria: that is, I think it would be well to introduce all the true Dodecandrous plants, having more than ten stamens, into Polyandria. This would, certainly, facilitate the labour of the student. For after being told that the Dodecandrous plants have from twelve to nineteen stamens inclusive, with what propriety do we include in the class Polyandria a number of genera, in which no botanist, perhaps, has ever observed as many as nineteen of

* "Professor Martyn, Dr. J. E. Smith, Dr. Darwin, Professor Willdenow, and others.

† "The stamens of Ribes are inserted into the calyx.

the male sexual organs; in which, at least, the number nineteen is exceedingly rare? In Podophyllum, Sanguinaria, and some other genera, we rarely observe more than fifteen or sixteen stamens.*

"The class Polyandria is subdivided into seven orders, viz. Monogynia, Digynia, Trigynia, Tetragynia, Pentagynia, Hexagynia, and Polygynia."

We finish our extracts by copying what Professor B. says of the classific character of Monœcia, or the twenty-first great division of the sexual system, page 137. Our readers will recollect, that herein are placed those vegetables in which the male and female blossoms, or, in other words, their styles and stamens, are not contained in the same empalement, but grow at some distance from each other, though upon the same plant, as in maize, cucumbers, and melons.

"The vegetables of the class Monœcia are arranged by Linnæus and other writers under very different natural orders or families. Chara and Zannichellia belong to the Linnæan order, Inundatæ, formerly mentioned.† Anguria, Trichosanthes, Momordica, Cucumis, Cucurbita, Sicyos, Bryonia, together with Passiflora of the preceding class, are referred to the thirty-fourth Linnæan order, *Cucurbitacæ*. M. De Jussieu's order, of the same name, comprehends these and other genera. Betula, Fagus, Quercus, Juglans, Corylus, Carpinus, and Platanus, belong to the fifteenth natural order, Amentaceæ.‡ Pinus, Cupressus, Thuja, &c. are referred to the fifty-first natural order, Coniferæ. The orders Amentaceæ and Coniferæ, in the method of Jussieu, embrace these genera. Zea, Tripsacum, Coix, Olyra, Zizania, and Pharus, are grasses, and belong to the order Gramina.§ Carex, Sparganium, and Typha, are of the third natural order, Calamariæ,‖ which are considerably allied to the Grasses.

"The United States contain a considerable number of the genera of this class. The following may be mentioned, viz. Chara, Lemna, Zea, Tripsacum, Carex, Sparganium, Typha,

* "In some of the earlier editions of the *Genera Plantarum*, several genera which were afterwards introduced into Dodecandria, had actually a place in Polyandria. I here mention the names of these genera, viz. Bocconia, Cratæva, Euphorbia, Peganum, Portulaca, Triumfetta, Heliocarpus, and Reseda. See Genera Plantarum, &c. Editio secunda. Lugduni Batavorum: 1742.—See Part I. p. 68. Note.

† "See p. 36.

‡ "See Part I. p. 115—117.

§ "See p. 12; and Part I. p. 120—122.

‖ "From *Calamus*, a reed.

Urtica, Morus, Betula, Zanthium, Iva, Amaranthus, Zizania, Pharus, Sagittaria, Fagus, Quercus, Juglans, Corylus, Carpinus, Platanus, Liquid-ambar, Pinus, Cupressus, Thuja, Acalypha, Ricinus, Stillingia, Momordica, Curcubita, Sicyos and Bryonia. All these are, unquestionably, indigenous genera within the limits of the United States, unless, perhaps, the two genera Zea and Cucurbita. The well-known Indian-corn (Zea Mays) was only found in a cultivated state; and the same remark applies to the different species of Cucurbita, such as the Cu. lagenaria, or Calabash, C. Pepo, or Pompion, and others.

"The American plants of this class deserve more attention than has hitherto been bestowed upon them. The Oaks of this country have, indeed, been lately examined by Mr. Michaux, in a work which reflects honour upon that author. He has, however, omitted several of the American species of this genus. The genus Juglans deserves as much attention. It will, I think, be necessary to divide this genus into two distinct genera. The Chesnut of the United States is a species essentially distinct from that of the old world. I call it Castanea Americana; for I am persuaded that the Chesnut and the Beech ought not be referred to the same genus. The Chinquepin of the United States (Castanea Chinquepin, *mihi*) is not a Fagus, but a Castanea. The Beech of North-America is now acknowledged to be distinct from that of the old world. It is the Fagus ferruginea of L'Heritier. The American species of Birch and Alder cannot, with any propriety, be referred to the same genus. They belong to two distinct genera, viz. Betula and Alnus."

The Appendix to this volume contains a synopsis of the several systems that have been invented by botanists, for the arrangement of vegetables, and for the introduction of method into this department of natural history. The plans of Cæsalpinus, Morison, Hermann, Ray, the Knauts, Boerhaave, Camellus, Rivinus, Tournefort, Ludwig, Pontedera, Magnolius, Linnæus, and Thunberg, are successively displayed; together with an explanation of the Calycine method. These tables will be considered by every person who has advanced far enough to comprehend them, as essays of ingenuity and talent, containing curious materials for an history of the human mind; but *young* students ought not to bewilder themselves with them. They may attend to them after having made themselves well acquainted with the Linnæan system.

Upon the whole, when we consider the learning and practical researches of the author, we consider his work as a substan-

tial addition to the number of valuable publications. It is calculated to render easy and familiar one of the most charming departments of natural knowledge; and, for this purpose, we hope it will be consulted, not only by the gentlemen who devote themselves to professions, but by others of liberal minds and easy fortunes. And we would fain indulge the expectation, that those individuals of the fair sex, who are studious of intellectual excellence and accomplishments, will profit by the labours of Dr. Barton.

ART. II. *A Treatise on Practical Farming; embracing particularly the following Subjects; viz. the Use of Plaster of Paris, with Directions for using it; and general Observations on the Use of other Manures: On deep Ploughing, thick sowing of Grain, Method of preventing Fruit-Trees from decaying, and Farming in general. By* John A. Binns. *of Loudon County, Virginia, Farmer.* 8vo. pp. 71. *Frederick-Town, Maryland.* J. B. Colvin. 1803.

FARMER BINNS, in this publication, has presented to the public a variety of his experiments in agriculture, particularly those which he made with the intention of convincing himself of the usefulness of gypsum, and afterwards of introducing it among his neighbours. Though there is little in the work which is new to a man who early listened to the advice of Mr. Wynkoop about it, yet it may be fairly allowed, that the author has set a good example, and given very seasonable precepts to the people among whom he lives. He has laboured zealously, and we hope successfully, to improve the system of husbandry in Virginia, by introducing gypsum into fashion among the cultivators of land. The wonders wrought by this substance, when employed for manure, have brought it into general use in the middle States, except in their maritime parts, where the saline quality of the atmosphere appears to decompose it, or, in some other way, to deaden its activity. The increasing demand for it has, for several years, been the cause of transporting to our sea-ports, vast quantities of it from the Bay of Fundy. It must be regretted that the United States have not hitherto been discovered to abound in this valuable article. There have been no strata as yet found, which furnish any quantity worth the mentioning. Hence, it is probable, the great supplies will continue to be brought from Nova-Scotia

Mr. B. in his chapter on the use of plaster of Paris, gives a detail of his experiments begun in the year 1784, on gypsum as a manure. From small beginnings he proceeded gradually to an extensive employment of it, until 1803. And he ives an instructive account, worthy the attention of all farmers who possess impoverished fields, how a poor farm may be changed to a productive one. His experience of eighteen years, devoted to the raising of Indian corn, clover, and wheat, by means of gypsum, is comprized in the first twenty-four pages. In the course of this narrative, the reader will remark, that Mr. B. by means of this manure, raised forty bushels of wheat per acre, (p. 17.) and produced such luxuriant clover, that the stalks when raised up were six feet high, (p. 11.) upon a farm that was so worn out, that when he moved there, his neighbours thought he must starve on it.

From the following extract (p. 25.) our readers may gather somewhat of Mr. B.'s opinion concerning the nature and quality of the sulphate of lime as a manure.

"And I can say, by experience, that I consider one bushel to be equal to one hundred loads of straw-manure, on old poor land, and that I should give the preference to the plaster.

"Some who are in the habit of using it, say, they believe it possesses a condensing power, that is, a power of attraction from the air, and in dry weather it draws down the dews on the grass and vegetables growing thereon, which operates as a stimulus to the grass; and that the grass of itself makes the ground rich, and prepares it to produce the next crop more copiously than the first. Here I beg leave, from experience, to differ in a measure from this opinion. I have, for ten years past, as I have before observed, cultivated a piece of ground in wheat, &c. every year, without any other manure than the plaster, except a little the present year on a knoll, and think it richer than any other part of my farm; although, when I came to it, it was much the poorest. Further, I have used little or no manure, except the plaster, on my garden for these ten years; and I am informed it had not had a coat of manure for one or two years prior to my arrival; and I consider the garden at this time to be almost as good again as it was when I got possession of it. I therefore conclude, that the good qualities the plaster possesses must be from its acting as a manure, and not from its power of attraction; although I will acknowledge that every kind of manure, I believe, possesses this quality in a greater or less degree, particularly salt. If you will spread horse or sheep manure, both of which are of a heating and sti-

mulating nature, over a poor knoll, and cultivate it in a dry season, you will find the ground where the manure is spread to be much moister than the other. I must also observe, that plaster, sowed on ground, and ploughed in, will have equally the effect on a crop of wheat, corn, or grass, as that sowed on the ground over the wheat, &c. And I consider one thimble full wetted and rolled on corn, and buried six or eight inches under the earth, will have as great an effect as that of a spoonful of it will have on the top of the earth, and around the roots of the corn, and much quicker in its operation; of course, the opinion that its only quality is of a condensing nature must be erroneous.

"There are others who assert, that it has a power of attraction from the earth, and will, in the course of five or six years, draw all the nitrous particles out of the earth, and render it poor. The experiment on the ground cultivated in grain, &c. for ten years successively, will prove this opinion also erroneous.

"There are others of opinion, that in the course of a few years it will render the land so light, that when cultivated, the north-west winds will carry off the top of the soil. This opinion is also erroneous; for when I first came to my farm, two horses in a plough would break up the ground much easier than three will do it now.

"I have heard another observation by some, that in the course of twenty or thirty years use of the plaster, the land will become so stiff as to render it impossible to break it up. Hearing of this idea, I sowed half a bushel of plaster on the two hundred and fiftieth part of an acre, which is at the rate of five hundred bushels to the acre, and have not discovered the spot to be too hard to plough, so that, according to this rule, in five hundred years the ground may still be ploughed; therefore this idea respecting the plaster is groundless.

"1st. My opinion of the plaster is, that it is a manure the best and richest in the world, not from quantity but quality.

"2d. The virtues it possesses, I conceive to be of different qualities, all of an agreeable nature to vegetation.

"3d. I consider it to be of a dissolvent nature, and will dissolve on the ground, by one shower of rain, almost as quick as loaf-sugar. It therefore acts as an immediate stimulus to the earth; which no other manure will do, it taking a considerable time for it to rot and mix with the soil.

"4th. I believe it possesses an astringent quality; for if sowed on a light soil, it will stiffen and close the ground, and thereby prevent it from washing the gullies.

"5. I conceive it possesses a cooling nature to the earth and vegetation; for if sown on grass, corn, and wheat in the heat of summer, it will, on some soils, after a shower of rain, show its effects in forty-eight hours; but, if sown in the winter season, it will make no show until the spring of the year, and thereby differs from any other kind of manure.

"Before I conclude respecting the use of plaster, I would advise every person who finds that the plaster has not a quick effect upon their lands, so as to make a change for the better on the first crop, to sow it over their lands one or two years before they cultivate it, and roll all their grain with it at the time of planting or sowing; and I will venture to insure them, if they will divide their farms into three fields, and use the plaster in this manner before and at the time of sowing or planting, it will answer every soil in America.

"There are several places on the Catocton Mountain where some few years past, the corn-stalks, when the tops were taken off, were not above three feet high, and which would not produce more than two or three barrels of corn to the acre, and from five to six bushels of wheat; and perhaps not yield grass enough to the acre to feed a horse for two weeks after the harvest was taken off; but, from the use of plaster, will now produce from six to eight barrels of corn, and from twenty to twenty-five bushels of wheat per acre; the luxuriant growth of the white and red clover after harvest gives the fields which once looked like a barren waste of country, the appearance of a beautiful meadow."

For an account of the body of solid information, collected by Judge Peters on gypsum, we refer to the Review of it in our vol. i. p. 346.

In reciting his experience with the different sorts of gypsum, Mr. B. seems to give the preference for quickness and power, first, to the red kind from Nova-Scotia; next to the yellow species from the same place; and, thirdly, to the plaster from France. By the use of it, he says the crops of Indian corn are almost doubled, and those of wheat tripled, and even quadrupled; and, during this increase of produce, the soil is continually acquiring strength and fertility. The use of it will also make the coarse and unsavoury brome-grass disappear, and introduce red and white clover in its place.

Among the observations which this treatise on practical farming contains, we observe some on the manure of barn-yards, &c. which are highly worthy of attention in a medical point of view. We extract them in the author's own words, p. 43.

"Cattle-manure is tolerably good, and will require thirty loads per acre to enrich it.

"I expect to manure at least one-sixth of my plantation this present year; but it was not for the health of my family, and its tendency in correcting, loosening, and meliorating the soil made stiff by plaster, I should never think it worth the expense or trouble of carrying it out. When I reflect that its effluvia, in warm moist weather, will produce intermittents and remittents, and, in cold moist weather, will produce quinsies and pleurisies, these circumstances make me anxious to cleanse my stables, stack-yards, cow-pens, hog-pens, wood-yards and ash-heaps by the first of June. This rule I have always followed ever since I began to farm for myself, and can say that my family have never experienced an intermittent or remittent, unless attacked with them from home first, and upon their return they have immediately left them. In my travels, wherever I have discovered those kinds of fevers, I have always observed either dirty, filthy stables, hog-pens, or water standing in their cellars, or ponds of water not far off: I have also observed those places most liable to dysenteries. Hence, the great utility of hawling out the manure of all kinds, and cleansing out cellars, and filling up the ponds to prevent the water from collecting and stagnating, and thereby preventing those epidemical maladies from taking place in families. If every family would observe this most strictly, they would have little need of having recourse to the apothecary-shop, too commonly resorted to in my neighbourhood. My family have consisted of about sixteen or seventeen, little and big, for eighteen or nineteen years past; and since I have observed this rule, they have been the healthiest of any family within my knowledge; there has been only one death in the time, and that was an infant which was suffocated by the mother's milk, it was supposed, in the night; and I do not recollect but one or two instances of any of them ever laying up for more than two or three days at a time by sickness, one of which was attacked by the rheumatism, the other by the small-pox. I once more repeat, that I verily believe the reason my family have been clear of those epidemical complaints, more than the rest of my neighbours, to be entirely owing to my removing all nuisances from my dwelling-houses, barn, stables, stack-yards, &c. and I sincerely hope this may become a universal practice with every farmer: besides, there is part of the nitrous particles lost out of the heaps of manure by every rain that falls; it cannot, therefore, be of near the strength, after laying in a heap, for one or

two years, as if it was spread out and ploughed in before it is rotten."

These are remarks of great importance to every rural economist, who will instantly perceive, that the hints they contain conduce, at once, to abundant crops, to neatness of living, and to the prevention of diseases. We add our own conviction of their excellence, and our recommendation of their utility.

The author urges the propriety of deep ploughing, and in this agrees with Mr. Moore, whose work on that subject, reviewed in our vol. v. p. 316, will be recollected with pleasure by our readers. He advises thick sowing as very advantageous, particularly on very rich land. He extols red clover, as making the cattle which graze on it during the whole season, fatter than any other pasture, and as affording the best kind of hay, when properly cured, for any kind of stock. In this latter opinion we apprehend many farmers will differ with him. His observations on the raising of sheep, on the cultivation of rye (which by the bye he strongly discourages), and on the management of peach and apple-trees, though concise and sententious, indicate an observing mind. A few pages on the wheat tipula, and other insects, conclude Mr. B.'s performance.

There is a modesty or backwardness in most of our practical farmers, which is unfavourable to publication, and even to composition. Many of them who add sound judgment to nice observation and long experience, accumulate large stores of knowledge: and, too frequently, this being not perpetuated by writing or printing, dies with him, whose life was expended in the collection of it. So many precious remarks, inventions, and discoveries are thus lost to mankind, that a book or a pamphlet from a citizen of this class is received with a more than ordinary welcome.

Every fact of this sort may be considered as a grain added to the heap; and if other matter-of-fact-men shall be emboldened, by the example of Mr. B. we shall be sooner enabled to winnow away the chaff of error, and to lay up the clean seed of truth in the garner of wisdom.

ART. III. *An Estimate of Commercial Advantages, by Way of Mississippi and Mobile Rivers to the Western Country; Principles of a Commercial System; and the Commencement and Progress of a Settlement on the Ohio River, to facilitate the same: with a Statement of Facts.* 12mo. pp. 70. *Nashville.* M'Laughlan. 1799.

HE who desires to peruse the narrative of an attempt to form a settlement on the Ohio, about two miles below the mouth of Cumberland river, in the year 1798, may be gratified by procuring the publication now before us. It was proposed to call it *Smithland;* but the views of the settlers not according at that time with the policy of the national government, then on the brink of war with France, and unwilling to provoke the hostility of the native Indians, the project was interrupted by public authority. Mr. Zechariah Cox, who seems to have been the leading man in that enterprize, appears also to be the writer of these pages. The greater part of them is a kind of appeal to the public, as a vindication against the wrongs he supposes himself to have suffered, and defending his reputation against the aspersions which had been thrown upon it. Into these it would be foreign to the purpose of our review to make inquiry.

The most interesting part of the work is the geographical; and this consists chiefly of the distances, portages, and prices of conveying produce, from the Ohio, through the Mobile and Mississippi, to the Gulf of Mexico, and *vice versâ.* In pursuing this object, Mr. C. states, that Mobile Bay, which receives the Tombigbee and Alabama rivers, is navigable, by means of the former of these streams, to the lat. 31 deg. 30 min. N. by sea vessels. This is half a degree north of the Florida line, and to this point the tide ebbs and flows. From the Tombigbee, boats of fifty tons burthen may enter Sipsey's river, and proceed up it as far as lat. 33 deg. 45 min. and the same may be done on the Tombigbee itself. From the head of this navigation to the main river, Tennessee, is about fifty-five miles; and to the nearest branches of the Tennessee, extending from the lower and upper ends of the Mussel-shoals, only thirty-five miles. Between these head waters the country is level, and well adapted for forming a portage to convey country produce and merchandize. The distance from the head of Mobile Bay to the head navigation of Tombigbee and Sipsey's rivers, is about three hundred miles by water. A boat of twenty-five tons

burthen can pass and repass, in thirty days, with the strength of ten men. From the head navigation of the southernmost streams which fall into Tennessee river to Knoxville, on Holstein river, he computes the distance to be about three hundred and fifty miles. The time of passing backwards and forwards between these two points, in a boat of twenty-five tons, worked by ten men, is thirty-three days.

Having thus computed the distance and time of going to Knoxville, by the Mobile, the Tombigbee and the Tennessee, Mr. C. contrasts the expense of transporting goods by this route, with that which is paid for carrying them to Knoxville, across the country from Philadelphia, and shows that the latter is, by a vast difference, the most expensive. And he applies the like reasoning and calculations in favour of getting goods by the Mobile, up to Nashville, on Cumberland river, about four hundred and sixty miles distant from the southernmost streams of the Tennessee. Mr. C. then endeavours to prove, that goods cannot be carried to Nashville from any of the Atlantic ports by the way of Pittsburgh, and down the Ohio, by a large difference so cheap as by the Mobile, &c. &c. He next makes an estimate to show, that even the people at the falls of the Ohio, which are about seven hundred miles below Pittsburgh, can be supplied cheaper by the south, from the Mobile, Tennessee, &c. than from any port of the eastern shore of the Atlantic.

Not content with these interesting views of our western inland navigation, this exploring genius next makes an effort to prove, that the transportation by the Mobile, or the *Mobile Commerce* as he calls it, will be found easier, quicker, cheaper, and safer, than that on the waters of the Mississippi itself; and that by the former of these routes, merchandize can be delivered at the junction of the Ohio and the Mississippi upon considerably cheaper terms than by the latter. This is owing to the impetuosity and turbulency of the Mississippi current.

Zealous for the interest of the western states, Mr. C. afterwards contrasts the Mississippi's commerce, inferior as it is to the Mobile commerce, with that carried on to the western regions, by the way of Philadelphia. By calculation, he endeavours to show, that Knoxville, Nashville, Rapids of the Ohio, and even Pittsburgh, can be furnished with foreign merchandize, by the Mississippi, Ohio, &c. difficult as their navigation is, upon terms greatly preferable to those which the conveyance from Philadelphia affords. In short, according to Mr. C.'s view of the subject, the Mobile commerce is the best

for the western states, the Mississippi commerce next in value, and the Philadelphia commerce less advantageous than either.

Whether these calculations and estimates are just, time will discover. The possession of the mouths of the Mobile, and the Mississippi, will give a new direction to much of the pecuniary and physical power of our citizens. Then, and then only, will the interests and experience of men of business determine by what route articles of foreign manufacture, intended for domestic consumption, can be brought to their doors at the most convenient and economical rate. And from the present aspect of affairs, it is highly probable the active and laborious writer of the piece under review, may live to see how well his speculations will correspond with events.

ART. IV. *List of the Post Offices in the United States; with the Counties in which they are situated, and their Distances from Washington City.* 8vo. pp. 39. *Printed by Order of the Post-Master-General.* 1803.

THERE are very few things which give a more striking idea of the progress of settlement and improvement in a country, than the post roads which pass through it, and the post offices established thereon. By these institutions we learn, that the face of the land has laid aside its savage features, and assumed a mild and civilized aspect. Forest trees, and sylvan plants give place to grain and herbage, affording nourishment to man and domestic creatures. Neighbourhoods thicken, villages spring up, towns are peopled, and intercourse is multiplied. Industry wishes a market for her supplies of produce; the introduction of taste and elegance brings home foreign manufactures; in short, highways are made safe and convenient; travelling is frequent, fashionable, and necessary; and intelligence sought after with a proportionate eagerness and appetite.

The growth of the business, and of the curiosity of a people, is manifested in the most unequivocal manner, by the letters, newspapers, and pamphlets which circulate among them. And as these are conveyed by the mails along the post roads, and are received at, and distributed from certain offices, fixed at proper distances from each other along those roads, the intellectual, as well as manual employment of the inhabitants, can

be, in a good degree, judged of by the sealed parcels which they send to others, and which are sent to them.

Judging by this rule, the enlarged population in the United States is accompanied with a full proportion of mental and corporeal activity. An enumeration of the post towns, which occupies thirty pages of close octavo print, is a proof of the surprisingly rapid advances of the numbers and powers of our citizens. With a spread and multiplication which, perhaps, has no example in any age or region, these public ways are lengthening and ramifying through every part of the country, and bearing to the neighbouring inhabitants commercial advices, political news, republican discussions, literary speculations, and scientific intelligence.

By this catalogue of Gideon Granger, Esq. the present Post-Master-General, it appears that there are already, with a trifling abatement, *thirteen hundred Post Offices in the United States!* and at each of these a deputy Post-Master. Under the direction of that able and enterprizing officer has this account of the different post towns been compiled from authentic documents. Though this is but one, among many, examples of the improvements which he has made in his department.

The titles of the post offices are arranged alphabetically, which makes it as easy to find such a word as any term in a common dictionary. Each page is divided perpendicularly into four columns. The first contains the name; the second the county; the third the state; and the fourth the distance from the General-Post-Office at Washington, in English miles. The book is full of instruction; and, considering the indication it gives of the actual increase, employment, and information of the citizens of the United States, and the prospect of their augmented resources, happiness, and knowledge, we must confess this publication of the Post-Master-General is one of the most interesting that has issued from the press since the commencement of our labours as reviewers.

On this occasion, we cannot forego the mention of that liberal provision which our government has made, for the diffusion of knowledge through the medium of the Post-Office. When the mode of conveyance, and the size of the mails will admit of it, magazines and pamphlets may be transported in the mail, at one cent a sheet (*sixteen* printed pages 8vo.) for any distance not exceeding fifty miles, at one cent and one-half for any distance over fifty and not exceeding one hundred miles, and two cents for any greater distance. And the Post-Master-General, in any contract he may enter into for the con-

veyance of the mail, may authorize the person with whom such contract is made, to carry newspapers, magazines, and pamphlets other than those conveyed in the mail.

To the readers of the Medical Repository, in particular, we would thereupon suggest, that a quarterly number of that periodical work costs a subscriber, living at the greatest distance from the place of its publication, only thirteen cents, which, on the supposition of its containing one hundred and four pages, or six sheets and an half, exactly amounts to that sum. This is more moderate than the postage of a single letter for the same distance. Gentlemen, in different and distant parts of our country, may thus be enabled, by a cheap, expeditious, and certain mode of conveyance, to receive the Medical Repository immediately after its issue from the press, and thereby keep up the circulation of the work, and diffuse the information which it contains.

MEDICAL & PHILOSOPHICAL NEWS,

DOMESTIC.

PESTILENTIAL DISEASES IN THE UNITED STATES.

THE summer and autumn of 1803 re-produced the Yellow Fever in many parts of the United States, and especially in the cities of New-York and Philadelphia, and at Alexandria, in the State of Virginia. Besides these places, which, from their populousness and commercial importance, principally attracted the attention of the public, different parts of the interior of the State of Pennsylvania, particularly along the shores of the Susquehanna and its branches, and some parts likewise of the interior of the State of New-York, exhibited many instances of malignant disease, characterized by all the symptoms of Yellow Fever. In connection with this epidemic, it was observed that intermittent and remittent fevers were exceedingly prevalent in many parts of the country,* especially

* *The following notice of diseases in the country adjacent to the city of New-York is derived from an actual observer.*

During the prevalence of Yellow Fever in the city, there was a full proportion of sickness in the neighbouring country. We do not here mean the cases of the city-malady which terminated fatally, or otherwise, after removal out of town. A considerable number of such occurred. In some the individuals already sick fled to a neighbouring hamlet or village, for safety. In others, persons who left the city in good health fell sick after arriving at their places of destination, or on their way thither. A large proportion of such cases ended in death. Indeed there was scarcely a recovery: And yet the distemper, though carried to all quarters by the flying inhabitants, made no further progress among the people, nor spread itself around by contagion. Where the person stopped, the disease also stopped; and with the termination of the fever by death or recovery, there was also an end of the whole affair. There was no such thing as contagion spreading by seeds, or sparks, or fomites, or any other of the fancied modes, from a centre round about.

But there were cases of diseases, indigenous and sporadic in various parts of the country, which bore a close resemblance to the scourge of the metropolis. Fevers of various types, from the remittent to the ague, were frequent in several parts. In some cases the remittents ran their course in four or five days, ending fatally with dark discharges and yellow skins. The stomach and intestines were generally much disordered. Sometimes after a sharp attack, the remittent would, in a few days, change its type to intermittent, and harrass the patient. The more common form of the dis-

in the States of New-Jersey and New-York, and, in numerous instances, were remarkable for their violence and obstinacy. In many towns and districts of the New-England States Dysentery raged with great frequency, and proved unusually malignant and fatal. The town of Stratford, in Connecticut, suffered greatly from this disease, and for some time was abandoned on that account by a large proportion of its inhabitants. Scarlet Fever also prevailed in many parts of the country in the course of the season. New-Haven was visited by Dysentery and Scarlet Fever at the same time, and suffered considerably from both diseases. In various districts of Massachusetts, New-Hampshire, and Vermont, one or the other of these diseases, but chiefly Dysentery, formed a very general and destructive epidemic. Dysentery also prevailed in some parts of South-Carolina.

YELLOW FEVER IN THE CITY OF NEW-YORK.

About the 18th of July the Yellow Fever began to excite attention in this city, and continued to prevail more or less, till the close of October. During that period, the deaths from this disease were between six and seven hundred. The alarm and flight of the inhabitants were very suddenly produced; and the suspension of business and desertion of the city on this occasion far exceeded what had been ever experienced in former seasons.

Nothing very remarkable distinguished the weather during the spring-months, or the first of the summer. The month of June was generally pleasant, and, from the prevalence of northerly breezes, seldom produced an oppressive degree or continuance of heat. In the course of this month, Palsy and Apoplexy occurred with unusual and alarming frequency; in some instances they assumed appearances which more generally be-

ease was the "bilious" and "remittent" fever, to which the ears of the people had always been accustomed, and such as had of old prevailed throughout the land. Added to these, intermittent fevers were uncommonly prevalent. Tertians were the most common, and sometimes they were double. There were likewise quotidians. And some of all these were severe and violent. One while they came on without chilliness, and ended after a burning heat without sweat; then, again, the chill would be considerable, and a sweating stage close the paroxysm. They attacked both sexes, and boys and girls had it as severely as adults. We knew a woman in child-bed to undergo violent fits of the tertian, while her infant escaped. But these intermittents were rarely or never mortal, though, in numerous instances, they, for a time, prostrated the strength of whole families before them. On Long-Island particularly, all these forms of disease were very prevalent.

long to malignant fevers; and to attentive observers of the succession of diseases and the precursors of pestilence, they gave no small apprehensions of impending mischief.

Early in the month of July the weather lost its mild and agreeable qualities, and became extremely warm. With the exception of five or six days, this month was more intensely and uniformly hot than ever we remember before to have experienced, in this climate, for the same space of time. The mercury in Fahrenheit's thermometer was very frequently upwards of 90 degrees, and seldom fell below 80 degrees for many hours of the day. The nights produced so little abatement of this high temperature, as rarely to afford much relief from the oppressiveness of the solar blaze. Such heat could scarcely be expected to continue for any length of time without pernicious consequences. Towards the end of June, and in the beginning of July, many cases of Scarlatina Anginosa were observed; and, during the same time, instances of catarrh and croup occurred, which could not be satisfactorily referred to variations of temperature. About the 18th of July, as was before observed, cases of malignant fever began to excite the apprehensions of the public. Before this time, indeed, instances of suspicious fevers had been observed in various parts of the town, which exhibited the strongest marks of malignity; but which, from their dispersed and sporadic appearances, and the general conformity of their symptoms to the more usual diseases of the season, passed under the popular denomination of bilious fevers. The first public alarm took place from some deaths at the Coffee-House slip, and in that neighbourhood, where, from the number and malignity of the cases, the atmosphere must have been charged with miasmata of great virulence. About the same time the disease was observed in many other parts of the city; and though the number of cases at any one time could never be pronounced great, they were, certainly, more generally diffused, and left fewer parts of the city exempt from them than in former seasons. The streets lying near the margins of the two rivers, and those inhabited by the poor, uncleanly and dissolute classes of the community, suffered the principal ravages of the disease.

Persons of all ages, except very young children, were subject to the attack of this epidemic. In former seasons it had been observed that feeble, delicate and aged people were less liable to it than the robust, active, youthful, or middle aged. This was, perhaps, verified in the late season as a general observation; but it is also true, that an unusual number of the

aged and weakly were found among the victims. Many of this description, who had long been confined to their houses, and who could not possibly have received the disease otherwise than through the medium of the common atmosphere, were attacked with very malignant symptoms, and very rapidly swept away.

Symptoms.

The phenomena of Yellow Fever in this season, did not materially differ from such as heretofore have been observed to characterize the disease. In regard to mildness and malignity, every grade we have been accustomed to see on former occasions, was again exhibited in the progress of this epidemic. Most commonly the disease began with high-toned inflammatory symptoms, which continued a longer or shorter time in different cases, and then yielded their place to a torpid or feeble state of the heart and arteries, great prostration of strength, with a concentration of morbid violence in the stomach, brain, or in some other vital organ. This course of symptoms often occupied the chief part of a week; and, when they were so moderate as to terminate favourably, a much longer space of time. Sometimes the cases were most alarmingly malignant and precipitate. A slight chilliness, and a transient hot fit, rapidly ushered in the disorganization of some vital viscus, which extinguished life in 18, 24, 36, or 48 hours. The malignant symptoms of black vomiting, yellow skin, hemorrhages, coma, delirium, convulsions, &c. were as often exhibited as in former seasons. The phenomena which distinguish the oriental forms of pestilence, viz. glandular swellings and carbuncles, were observed in a few instances, but not more frequently than heretofore.

Treatment.

In the mode of treatment, little seems to have been added to the experience of preceding seasons. Blood-letting, diluents, cathartics, the application of cold or tepid water to the skin, blisters and mercury, formed the principal groupe of remedies. The efficacy of blood-letting in the early hours of the disease, so as to meet and arrest the re-action of the first paroxysm, cannot be too highly rated. Cathartics were also administered as soon as possible after the attack; the mild ones were generally preferred, and sometimes the evacuation of the intestines was entirely trusted to the assiduous use of injections. Large blisters were likewise applied as early as possible. They were

laid on the epigastrium in the first instance, from the belief of the stomach and upper intestines being the principal seat of the disease, especially in the early stage; and afterwards they were successively laid on the wrists, ancles, and other parts. In violent cases, the cuticle was removed soon after vesication was completed; an irritating ointment, highly impregnated with cantharides, was applied to the naked skin, and every effort was used to produce a deep and painful exulceration, as quickly as possible, over the whole of the blistered surface. No part of the treatment of this disease seems to admit of more improvement, than that which concerns the means of irritating the skin, and the extent, as well as the degree to which this irritation may be carried. How large a portion of the whole skin might be advantageously subjected to the action of cantharides or caustics, especially in malignant cases, which require the boldest interposition of the most powerful remedies, remains yet to be ascertained by experience. In the advanced stages of the disease, when the powers of life were sinking into prostration, and heat seemed beginning to desert the skin, (and, in some instances, at an earlier period) a saturated solution of common salt, employed by way of fomentation, with as much heat as the skin would safely bear, often produced the best effects.

To allay the commotion and distress of the stomach, which forms so great a proportion of the anguish and danger of this disease, nothing appeared to be equal to ice-water taken into the stomach, as cold as possible, by small quantities frequently repeated, and largely as well as frequently thrown into the intestines by way of injection. In many instances the progress of black vomiting was arrested by this remedy; and nothing could exceed the eagerness and gratification with which it was received by the sick.

The preparations of mercury were often used for cathartic, as well as salivating purposes; and whenever a salivation was produced, it was followed by the best effects. It is to be regretted, however, in the use of this remedy, that its good effects are sometimes so slow and uncertain, and the accomplishment of a salivation in malignant cases so frequently impracticable, as to render a reliance upon it too often unsafe in this rapid disease.

Origin of the Disease.

The question concerning the origin of this epidemic has been agitated with as much ardour and inflexibility as on any

former occasion. The proofs of its domestic production, in our opinion, are greatly accumulated, and rendered much more convincing and satisfactory than ever, by the occurrences of the late season. It would be improper here to reiterate the arguments on this subject which have been so often presented to our readers in the course of this publication. The reinforcement of evidence, which the late season is supposed to afford, arises, partly from the state of the weather, and of diseases preceding this epidemic, and many circumstances of the epidemic itself; and partly from the futility of all the accounts of its introduction into New-York from the West-Indies, and its conveyance to Philadelphia.

Those who contend for the foreign origin of this disease universally believe in its importation, by some vessel or vessels which arrived at this port towards the end of June, or early in July. They do not all agree as to the particular vessel; and as to the detail of circumstances, no individual among the importers seems to have taken the trouble of making out a formal or consistent story. Three vessels have been most frequently mentioned, viz. the *Hibbert*, the *Gypsy*, and *La Victoire*, the two former from Europe, and the last from St. Domingo. An account of the *Hibbert* was given at page 86 of this volume. The British ship *Gypsy* arrived on the third of July, from St. Ubes, in Portugal, laden with salt. St. Ubes was perfectly free of any malignant or epidemic disease at the time of her sailing, which was regularly certified by a bill of health. The *Gypsy* had no sickness on board while she lay at St. Ubes, during her voyage thence to New-York, nor until seventeen days after her arrival in this port. The French ship *La Victoire*, Captain Dominique Morel, sailed from Dunkirk, March 10, 1803; after a passage of forty-one days, she arrived at Cape-François, with a cargo of dry goods; she lay at Cape-François two months and a few days, and then set sail for New-York, where she arrived on the ninth of July. During the voyage from Dunkirk to Cape-François, during the time she lay in the harbour of Cape-François, and during the voyage from the Cape to New-York, no sickness happened on board, except one case of dysentery at Cape-François, which terminated in health. The Cape was at that time remarkably healthy. Her cargo consisted of coffee, put up in tight casks, sugar, and lignum-vitæ. She was detained for some days at the Quarantine ground, for the purpose of inspecting the coffee, which was found to be perfectly sound. While she lay at the Quarantine ground, she was ventilated, white-washed, and the clothes

and bedding washed and aired. The day before the permit was given for proceeding to New-York, a block fell from aloft on the head of a sailor, which hurt him so slightly, that it was not judged expedient to detain him at the Marine Hospital. No other sickness had taken place in this vessel up to the twentieth of August, the time at which this account was delivered, under the signature of the Captain. All the leading facts above stated had been given by him to the Health Officer, under oath, at the time of his arrival.

Thus then it appears, that if Yellow Fever was introduced from abroad by any of the vessels charged with the importation of it, the conveyance must have taken place either from parts of Europe, where the disease did not exist, and in vessels which had no sickness on board, till some time after arrival at the port of New-York, or in a vessel from St. Domingo, on board of which no case of Yellow Fever had existed, and which arrived at the port in extraordinary circumstances of health and cleanliness. If the contagion of Yellow Fever can be introduced from the West-Indies under such circumstances as these, we can never hope to escape it by any regulations of quarantine which human ingenuity can devise.

Question concerning Contagion.

This question likewise has been so frequently treated in the course of this work, that it appears to be almost unnecessary now to renew the discussion. All the facts tending to evince the non-contagiousness of Yellow Fever were again displayed throughout the late season, and, if possible, with augmented force and luminousness. A large proportion of the epidemic consisted of instances in which an individual only was attacked in the midst of a family, the members of which assiduously attended the patient without contracting the disease. Many aged and very young persons, whose condition imposed confinement in their houses, without the occurrence of any preceding case in their families, were attacked with the disease in its most virulent form. Multitudes also took the disease who had not previously approached any sick person, any suspected vessel, or any fomites alleged to be imbued with contagion. One person was attacked in the debtor's prison, who, for three months before had not been beyond its walls; and no other person in the prison was previously, or subsequently, affected with the disease. Many who had fled from the city were attacked with the disease and died, not only in all the surrounding country, but at Newark, Elizabeth-Town, Bruns-

wick, &c. without even communicating infection in a single instance to physicians, nurses, or any other attendants.

But one of the most decisive proofs of the non-contagiousness of Yellow Fever is derived from the absence of all contagious influence from our Yellow Fever hospitals. Those of New-York and Philadelphia are here chiefly alluded to, as being best known to us. These asylums are generally erected within two or three miles of the cities to which they belong, but entirely beyond the range of atmosphere contaminated by the local miasmata of the city. Neither in New-York nor in Philadelphia is there a single example of a person employed in these Yellow Fever hospitals* being attacked by that disease, unless he had previously passed some time within the limits of the sickly city. This proof will appear the more decisive, when it is recollected how many persons belong to a hospital in the various capacities of medical men, nurses, orderlies, washer-women, servants, &c. and especially when it is recollected, that the patients sent to such institutions generally consist of the most indigent and dissolute class of society, people unaccustomed to the blessings of cleanliness and ventilation in their dwellings, persons, clothing, &c. This description of people will be liable to the most virulent degrees of the disease; and if a secreted contagion be ever thence produced, they will be the most apt to produce, accumulate and exalt such contagion to the highest point of malignity, in their persons and clothing, and afterwards to exhale it on all who approach them. The same ward commonly contains several of these unhappy subjects, the sick, the dying and the dead; and, if contagion exist at all in these cases, such a ward must contain the greatest quantity and the most noxious degrees of that destructive poison. Let the danger of the nurse, in attending such patients, be estimated from the detail of the services she undertakes to perform. She must be frequently in contact with the person, bedding and clothing of the patient: she lifts him out and into the bed; she administers food, drink, and medicines; she must often receive the vapours of breathing and perspiration in their most concentrated state; she receives and conveys away the foul clothing of the sick, replete with excreted matters; she receives and removes the excremental discharges; and, finally, she is compelled to remain, for hours, and days and nights, exposed to all this combination of dan-

* It is here to be distinctly understood, that we speak of hospitals for persons labouring under *Yellow Fever*, and not *Typhus*, under any of the various denominations of Ship, Jail, or Hospital Fever.

gers which must constantly surround her on the supposition of contagion. Is it conceivable that contagion can in reality be secreted in such cases, and received, as it consequently must be, amidst all this closeness of contact and this incessant inhaling of the diffused vapours, and still the nurse, in every instance, escape without injury? It has been alleged, indeed, by way of explaining this escape, that the pure air of the country dilutes these vapours of contagion so as to render them harmless. But in the case stated, the nurse, by hanging over the bed, and by contact with the sick, undoubtedly inhales them in their most concentrated state. It has been likewise alleged, that the escape of such persons may be accounted for from the absence of a certain susceptibility in the system, which does not always exist. But, can it be admitted that so many different nurses, employed in such services for several months, could always steadily avoid falling into the susceptibility in question? And, lastly, it has been alleged, that the habit of sustaining the poison of contagion will soon enable nurses to resist it with impunity. It is clear, however, that habit will not account for the escape in the first instance, even if the force of it afterwards be admitted in the fullest extent.

This view of an interesting set of facts serves strongly to illustrate and confirm the position we have so often endeavoured to maintain, that Yellow Fever arises not from a secreted specific contagion, but from the respiration of a portion of atmosphere, locally impregnated with the miasmata of putrefaction. In fact, three causes generally concur in the production of Yellow Fever, viz. the atmospherical, local, and individual. Concerning the atmospherical cause, a difference of opinion prevails; some contending that it depends upon sensible qualities only, others upon occult and insensible qualities. That an atmospherical cause, however it may be constituted, truly exists, is proved by the experience of healthful seasons, while the local and individual circumstances are known to be in operation. That local causes exert a powerful effect, is ascertained by the prevalence of Yellow Fever in cities; while the disease is incapable of propagation in the adjacent country. And, lastly, that individual circumstances have great influence, is clearly established by the effects of fatigue, exposure to cold, intemperance, &c. while other persons, breathing the same air, and residing on the same spot, but avoiding such circumstances, are very frequently found to escape without injury.

The atmospherical contamination receives an interesting illustration, by comparing Yellow Fever with Typhus. The poison of Typhus is generated in, and adheres to the person, cloathing, bedding, furniture, and apartment of the sick, without contaminating the external atmosphere. Hence this disease, in this respect the opposite of Yellow Fever, is only contracted by intercourse with the sick, with substances which have been in contact with them, or with persons or things rendered infectious by gross inattention to cleanliness and ventilation.

Besides the prevalence of Yellow Fever in the city of New-York, it was also observed to rage, with violence, in the small town of Kaatskill, in the State of New-York. By an account we have received from Dr. Thomas O. Croswell, who attended the cases which occurred in that town, no doubt remains of the genuineness and extreme malignity of the disease, Dr. Croswell is confident that no imported contagion was concerned in the production of the cases which fell under his notice; as his inquiries were very carefully directed to this object. He ascribes the disease at Kaatskill entirely to the putrefaction of a large mass of fish, which produced the cases which occurred precisely in the direction in which the miasmata, exhaling from this offensive mass of animal matter undergoing decomposition, were known to be wafted by the prevailing wind. The number of deaths in this place was very considerable for the population of so small a village; more particularly as they were confined to the course in which these vapours were carried, or to persons who had visited the noxious spot. The disease was not observed to spread from persons ill of it, when placed beyond the limits just now mentioned.

YELLOW FEVER AT PHILADELPHIA.

For the following account of the Yellow Fever, as it prevailed in some parts of the city of Philadelphia, in the course of the late epidemic season, we are indebted to the friendly communications of an eminent physician of that city, who was himself an eye-witness, and a principal actor in the occurrences which he relates. This statement of facts, together with Dr. Caldwell's excellent paper on the subject, will be sufficient, we hope, fully to gratify the curiosity of our readers.

"During the spring, and early summer months of the present year, 1803, the inhabitants of Philadelphia enjoyed a state of health uncommonly favourable. Except among children,

who were, as usual, affected by the disorders of the season, physicians found but little to call forth the exercise of professional skill. The few complaints that occurred among adults were of the most common, mild, and manageable nature. Nor did any event take place to darken the prospects arising out of this flattering and auspicious state of things, till between the nineteenth and last of July, when several cases of malignant disease appeared in the neighbourhood of Chesnut and Water streets. About the same period several other cases of similar nature made their appearance in Water-street, near to Race and South streets. These three neighbourhoods were watched, and for some time daily examined with the utmost attention and solicitude. Though some apprehensions were entertained as to the issue of these threatening appearances, it was deemed improper to excite public alarm, and arrest the progress of business during the remainder of the season, on account of an evil as yet very limited, which did not assume a contagious aspect, and which a favourable state of atmosphere might entirely remove. Fortunately a change occurred in the weather about the twelfth of August, after a heavy fall of rain; in consequence of which the disease was no more heard of till near the close of the same month. About this period it re-commenced, assuming a much more formidable appearance than it had before put on. Besides renewing its attack in the three original neighourhoods, it broke out afresh in another one, in Water, near Market-street, where it raged with more violence than in either of the former. Still, however, the disease did not spread by contagion; cases of it, when removed from Water-street to the more high and airy parts of the city, terminated without being communicated to nurses, physicians, or attendants on the sick. Notwithstanding this, the state of that district, extending from Market to Walnut-street, and from the east side of Front-street to the river Delaware, became so dangerous and alarming, that, on the twelfth of September, the Board of Health thought it expedient to advise the inhabitants to remove out of it, and to interdict all unnecessary intercourse between it and other neighbourhoods. Owing, however, to the favourable state of the weather, and the advanced period of the season, they declared to their fellow-citizens, that a general removal from the city was by no means advisable. This measure, though unpopular, and severely censured at the time, was afterwards acquiesced in by the moderate and discerning part of the public, as prudent and salutary.

"On the thirteenth of September the doors of the city hos-

pital were thrown open, for the reception of such sick persons as might be deemed suitable subjects for that institution. From this period till the fifth or sixth of October, the disease spread slowly through the city and liberties, but grew more and more mild and manageable as the season advanced, and as it ascended from Water-street to more elevated situations. Except in courts, alleys, and the unventilated dwellings of the poor, its range did not extend to the westward of Second-street. Nor did it, in many parts of the city, reach even so far. The whole of the city and liberties, except that portion which lies between Second-street and the river Delaware, remained as free from disease as it has ever been known in the most healthy seasons.

"By the fifteenth of October there was scarcely a case of malignant fever in the city. The public mind was now restored to tranquillity, and the citizens began to return from their short exile in the country. On the twentieth of the month the entire extinction of the disease was publicly announced by the Board of Health. On the twenty-eighth the city hospital was closed, as the general state of things no longer called for such an asylum.

"It is not practicable to offer exact estimates either of the number of persons attacked by the late malignant disease, or of the degree of mortality which that calamity produced. On the fifteenth of September, the Board of Health began to collect the new cases of fever from the physicians of the city and liberties, and discontinued the measure on the sixteenth of October. The cases reported to them during that period amounted to one hundred and sixty-one, besides twenty-seven cases of a suspicious nature, making an aggregate of one hundred and eighty-eight.

"Eighty-seven persons, affected by malignant fever, were received into the city hospital during the season. Of these *forty-nine* recovered, and *thirty-eight* died. Of those who died, *eleven* or *twelve* were admitted in the very last stage of the disease, several of them labouring under *black-vomit*. But few cases terminated fatally that were admitted as early as the second, or even third day after their commencement. From this it will be perceived that the mortality in the city hospital was not so great, in proportion to the number of patients it contained, as in former years. Perhaps this is to be attributed, in a great measure, to a less malignant form of the disease.

"Previously to the eruption of the fever in Water, near Market-street, about the last of August, but few persons had

died during the season of that disease. The number of deaths in the city and liberties, from that period till the close of October, including those that took place in the city hospital, amounted to five hundred and twenty-five. Of this number, one hundred and thirty-five occurred among children, *few* of whom, in all probability, died of malignant fever. Of the remaining three hundred and ninety deaths, at least one half must have arisen from the common diseases of the season. This leaves a balance of one hundred and ninety-five persons; which is, perhaps, the full amount of those who died of the late disease, which spread such terror through the city and country.

"I can add little as to the symptoms or treatment of the disease. The *stomach* was, as usual, the devoted organ, against which the enemy directed all his force. When the brain was affected, it appeared to be only through the medium of sympathy. Coma, delirium, and all other cephalic affections, struck me as the offspring of a diseased stomach. Indeed, were we able to command, to our satisfaction, the condition of this viscus, I believe we would seldom lose a patient in malignant fever.

"The only symptom partaking of novelty which fell under my notice during our late disease, either in private or hospital practice, was severe pains in the limbs, particularly the lower extremities, extending occasionally to the shoulders and lumbar region. This, though a very troublesome and grievous, was by no means an unfavourable symptom. On the contrary, I always congratulated my patients on complaining bitterly of "pains in their bones." Such complaints afforded me conclusive testimony that the disease had not made a serious attack on any vital organ. They bespoke a diffused, not a concentrated form of fever. I lost no one in this, which I denominated the *break-bone* state of the disease. Thus, on similar principles, the early occurrence and suppuration of buboes in cases of Oriental plague, afford a favourable prognosis. They manifest a *centrifugal* form of the complaint, and not a *centripetal* one, pouring the whole of its malignancy on the stomach and other abdominal viscera. They are, in their operation, like *blisters* or *issues*, calculated to preserve from destruction such parts of the system as are essential to life.

"In the treatment of our late disease, my principal reliance was placed on *venesection*, *pro re nata*, (but, in general, very moderate) free *evacuations from the bowels*, *blistering*, and *sweating*. The two last remedies I carried to a greater extent

than in former years, and, as I conceived, with the happiest effects. Blisters to the wrists, ancles, and scrobiculus cordis, acted oftentimes like a charm, in the removal of that terrible affection of the stomach, which was the source of my principal apprehension. Blistering and sweating manifested also the greatest efficacy in removing the *break-bone* pains from the limbs. By creating high *excitement* on the skin, they drew it from parts more deeply seated.

"Of the effects of salivation I have but little to say. Most cases that fell under my care were either too slight to require this remedy, or so rapid in their progress as to set it at defiance. I do not believe that I salivated more than a dozen of patients throughout the continuance of the disease, and those but slightly. It is proper, however, to remark, that they all recovered."

YELLOW FEVER AT ALEXANDRIA.

We have taken pains to obtain as much information as possible concerning the pestilential epidemic at Alexandria. To the kindness of Dr. Dick, an eminent physician, and Health-Officer of that port, we owe the following account of that city, and of the appearance of the epidemic, which commenced in the last of July and in the beginning of August.

"The population of Alexandria is estimated at something upwards of six thousand. It is situated on the west bank of Potomack River, and the houses on Water-street, together with those to the westward of it, stand generally about 25 to 30 feet above the level of high-water mark. The streets are laid off at right angles, which, with two exceptions, are 66 feet wide, and upwards. The squares are about 352 feet by 246. A considerable extent of ground has been made to the eastward of Water-street, and a new street, called Union-street, has been laid off, and built upon; beyond which warehouses are erected, and wharves extended to the channel of the river. These two streets are only fifty feet wide; and there is a pretty steep descent from Water to Union-street, the latter being not more than five or six feet above high-water mark. The streets are generally well paved, and especially in the commercial parts of the town; but many of the warehouses which stand on the low made ground, under which there are no cellars, are supposed to have water under their lower floors.

"It is believed that upwards of three thousand of the inhabitants deserted the town. From the western part of it there were but few removals; but it is probable that, in the three

ranges of squares next to the river, not more than a tenth part remained. The whole number of deaths occasioned by the epidemic was, I think, something upwards of two hundred; and it continued, throughout the season, to be singularly limited in its operations. I must here, for the sake of truth, venture an affirmation which will probably stand in opposition to some of the popular doctrines of the day. I witnessed, during the whole course of the epidemic, three distinct species of fever, which I have hitherto denominated Yellow Fever, mixt, and common autumnal remittents; the first and last defined by topographical boundaries. Whenever I was called to a patient in the western division of the town, I was ready to venture a decision from the symptoms alone, whether the subject had been occasionally exposed to the infected atmosphere in the other portion of it; while, on the other hand, I have scarcely met with a case of fever, within the limit of the infected part, which did not present, at once, in intelligible characters, its malignant nature. The intermediate description was often seen by others, as well as myself, in that space which may be considered as connecting the two extremes of the town.

"I have not been sensible of any peculiarities that distinguish this epidemic from those that have occurred in other places since the year 1793. A redness and heat in the eyes, with pain in the forehead, almost uniformly attended the attack; with sometimes a chilly sensation and pain, or uneasiness, more or less, about the loins or lower extremities. The pulse varied so much, with regard to strength, frequency and tension, both in the commencement and subsequent stages of the disease, as to furnish no characteristic but in its diversity. The bowels, in a great majority of instances, were obstinately inactive; the stomach generally quiet in the beginning, and especially so in the worst cases. A remarkable degree of heat in the skin was generally discovered from six to twelve hours after the attack. The tongue commonly became lightly frosted early in the disease, but sometimes continued florid and moist throughout some of the worst cases. Whenever a quantity of morbid bile, resembling tar, took possession of the intestines, coma generally took place early in the complaint, the stomach remained quiet, and the pulse preserved a condition more natural than in any other variety of the disease, till a short time before the close of the scene. On the other hand, when this redundance and quality of bile was wanting, the stomach grew restless on the second, third or fourth day; slight retching fol-

lowed, and soon after a discharge appeared, commonly at first resembling a strong infusion of tobacco, becoming afterwards thicker and darker; but sometimes, on the first appearance of the discharge, it consisted of a black, viscid, flaky matter, which adhered firmly to the sides of the vessel in which it fell. This state of the stomach was, for the most part, accompanied by a sudden depression of pulse, and a recession of animal heat from the extremities. This variety of the disease was more frequent than the former, but that was more uniformly fatal.

"So uniform was this result from the relative states of the stomach and liver, that I recollect to have seen but one or two instances, during the season, of black vomit connected with discharges of tar-like bile from the intestines. The observation struck me early in the epidemic, and it commanded my attention through its whole course.

"In the comatose cases, blood issued from points in the lips, and from the nose; and the skin became yellow earlier than in other cases; but the colour in these cases I thought materially different from that which marked the approach of death in the other variety. The one I considered as arising from the deposition of bile, and the other from an obstructed morbid excretion of the skin. And hence, in my practice, I have had a view to three points of diseased action—the liver, stomach, and skin; the former generally existing alone, the two last commonly connected. Three dissections which were made tended to confirm my impressions."

Dr. Dick ascribes the local origin of this malignant disease to a very large mass of oyster-shells, many of which contained oysters, or parts of oysters, in a state of putrefaction; and which emitted the most noisome effluvia he had ever experienced, in consequence of their being exposed to the heat of a brick-kiln, for the purpose of converting them into quicklime. It is probable this cause contributed much towards producing the virulent cases which occurred in the direction given to these effluvia by the wind, and which were observed to take place about the middle of August and afterwards. But it is probable this cause derived its activity from a pre-existing condition of the atmosphere in that neighbourhood; for it appears that Dr. Dick, and some of the other physicians of Alexandria, had observed malignant appearances in the fevers of that town so early as the last part of July and the beginning of August.

At Alexandria, as at Philadelphia and New-York, an ap-

prehension was entertained by some persons that this disease was introduced from the West-Indies. But besides the insufficiency of the evidence, the limitation of virulent cases to a circumscribed range of atmosphere known to be vitiated by a local cause, and the inadequacy of a non-contagious disease to spread by self-propagation; it is a fact that the vessel charged with the importation did not arrive till more than ten days after the time at which a malignant character began to be observed by the physicians in the fever of Alexandria.

BLOOD-LETTING IN YELLOW FEVER.

The following facts afford the most conclusive evidence of the efficacy of this remedy in Yellow Fever, when timely and sufficiently used. The malignity of the disease on this occasion is proved by the mortality which took place under the first mode of treatment. And the comparative results of blood-letting exhibit so fair and full a proof of its safety and usefulness, that we cannot avoid considering this body of testimony as the most unexceptionable and satisfactory that has ever come under our notice. It is extracted from the *Medical and Physical Journal* of London, for the month of June last.

"*A successful Method of treating Yellow Fever at its Commencement: Communicated, May* 25, 1803, *by Dr.* HARNESS, *Commissioner for sick and wounded Seamen.*

"Lieutenant Douglas, of the 25th regiment, relates, that he embarked on board the Chichester store-ship, at Jamaica, for England, with one hundred and eighty men, seventy-four of whom died on the passage previous to the reaching Halifax in North-America, exclusive of the captain, two lieutenants, surgeon, and surgeon's mate of the ship. In consequence of the two latter having fallen victims to the disease, Lieutenant Douglas felt himself driven to the necessity of undertaking the treatment of the sick; and from the great fatality attendant on the calomel and purgative plan pursued by the late surgeon and his mate, he (Lieutenant Douglas) was induced to adopt bleeding (as recommended by Dr. Jackson, and as had been suggested, in Lieutenant Douglas's presence, by the surgeon's mate of the 6th regiment, a short time previous to Lieutenant Douglas leaving Jamaica), which proved to be productive of the happiest effects, as will evidently appear by the following statement.

"Lieutenant Douglas relates, that after the care of the sick had devolved upon him, sixty-two men (thirty-seven of whom

were seamen) were attacked with the symptoms of yellow fever, the whole of whom recovered by bleeding. Three others were likewise bled, but, he observes, so late in the disease, or not until the symptoms of fever were so fully established, as not to be within reach of the remedy.

"Lieutenant Douglas remarks, the success in treating the disease was so evident to the troops and ship's company, that, after a short time, they would, on being taken ill, apply to be bled; and Lieutenant Douglas became so confident of its good effects, if had recourse to at the onset of the disease, as to induce him to give particular directions to be called in the night, should any one be seized with the leading symptoms of the disease; and in every case (the three alluded to excepted) he had the happiness to see every symptom give way or diminished, and unfavourable appearances removed by one, two, or three repeated bleedings, performed at intervals of a few hours, as the necessity of the remaining symptoms indicated.

"Lieutenant Douglas not being educated to the profession, and, consequently, ignorant of the doses of medicine, was induced to have recourse to clysters, when the procuring of evacuations appeared necessary; on which, with bleedings as before-mentioned, he rested the whole means of cure."

SOURCE AND CHARACTER OF THE PLAGUE IN EGYPT.

We now perform a promise made in our last number (see p. 77 of this volume), to give an account of some of the facts upon which Sir ROBERT T. WILSON founds his conclusions concerning the domestic origin and non-contagiousness of the Plague in Egypt, which we exhibit in his own words, as follows. (See *History of the British Expedition to Egypt*, p. 303, American edit.)

"The plague, as being the malady which occasions the greatest alarm amongst those who have never been immediately acquainted with its nature, ranks as the most fatal of all distempers.

"This fever, now properly called epidemical, was long supposed to have been brought from Turkey in the ships charged with old clothes, which constantly came to Alexandria for a market; but these and similar reasons cannot any longer be maintained, since the plague has generated annually in Egypt during the last four years (although no such communication had been possible), and even chiefly commenced in Upper Egypt.

"The source of this disorder must therefore be sought for in those phenomena with which the appearance is connected.

"The plague commences in Egypt when the Nile begins to fall, and ceases to be fatal (almost to a day, many pretend precisely so) after the 17th of June, which is the period of the summer solstice, and when the Nile is supposed to receive the first increase.

"As the waters of the Nile retire from the surface of the country they had inundated, a rich slime of considerable condensity is left, which forms a soil so productive as to render Egypt the most fertile land in the known world: but, unfortunately, the benefits of nature are always charged with a proportion of evil. This slime, subjected to the universal laws, is no sooner separated from its principle of action, than corruption ensues, and continues until all the putrid juices are totally absorbed by the heat of the sun, which then leaves the ground perfectly brittle, with the fissures previously described: the atmosphere at this time ceasing to be tainted, the plague throughout Egypt disappears.

"This theory, however natural to Egypt, cannot be immediately applied to other countries where the plague annually rages; but an examination into their climate, soil, and the customs of the people, will certainly prove the position, that the plague is local, occasioned by a corrupted state of atmosphere, and never introduced by contagion.*

"Since the French expedition to Egypt, great discoveries have been made as to the properties of the plague, by the ability and boldness with which the numerous cases have been treated.

"*Assalini*, in his excellent work, amongst many other remarkable facts denying the existence of contagion in the plague, asserts, that he found, by observation, in the French army, that if a battalion, infected, left its cantonment for another, the distemper not only ceased in that corps, but that no one having communication was exposed to the smallest danger: nor did the phenomenon terminate here; for even if the battalion which occupied the post left by the diseased battalion quitted the place in ten days, the slightest symptom of the disorder never appeared amongst them.

"As a proof of the plague being confined to atmosphere,

* "None contend that the plague is not, like all fevers, more or less infectious, according to habit of body and duration in bad air; but that the disease hangs only in the atmosphere, or breath of the immediately afflicted patient, not to be conveyed by touch on a third person.

independent of the examples its particular locality in Egypt offers, he mentions several remarkable cases at Jaffa,* of men who, confined in the hospital of that town by the plague, escaped into the desert, and endeavoured to reach the army, but, finding the attempt impracticable, returned again in three days, perfectly recovered.

"This extraordinary cure induced Assalini to encourage a removal from Jaffa, whenever the first symptoms were discernible; and every one on whom he could prevail to adopt this advice immediately became convalescent. Unfortunately, simple as the remedy is, death was more frequently preferred by the wretched patients, whom stupor and lethargy generally seized.

"To remove still more those doubts which the prejudice of long received opinions will reluctantly allow to be dispelled, the fact must be stated, that the English and Turkish armies which marched to Cairo passed through a country where the plague filled almost every village; that they communicated, without any precaution, in the most intimate manner, with the natives, established their ovens at Menouf, where the plague raged violently; that the Turks even rifled the diseased in the pest-houses of Rhamanieh, and at Cairo dug up the corpses recently buried; and yet that no individual instance occurred of the malady in the armies; whilst the troops who remained stationary at Aboukir were severely afflicted, and of whom one hundred and seventy-three died: yet neither at Rosetta nor Alexandria did the fever show itself.

"In Egypt, where the villages approach within a quarter of a mile of each other, some were exempt from this malady, whilst the most neighbouring were desolated. So common is this circumstance, that the inhabitants particularize to Europeans those villages in their districts which, during the season, the plague has appeared in, yet do not themselves refuse to enter into them; nor, indeed, did the English hesitate, although frequently the dying were laid by the gate through which they were to pass. When the plague has been most virulent in

* "Jaffa is described by Assalini as having a lake near the town, whose stagnant waters corrupting, occasion the fever called plague: he adduces as a proof, that the division encamped near, at first suffered from that fever. At Aboukir the dead bodies of the Turks, French and English might have occasioned the putrid miasmata containing the sources of the disease; and in favour of the hypothesis, medical men should know, that at Aboukir the plague continued longer than in any part of Egypt. The sun there, on account of the sea breezes, did not possess sufficient power to absorb all the mephitic exhalations.

Cairo, the inhabitants of the citadel have often been totally free from any infection, although having daily and promiscuous communication with the inhabitants of the city. There will be some difficulty in accounting, on indisputable inferences, for this partial infection of atmosphere, which at present can only be attributed to the different degrees of fœtid matter left on the ground, producing the quantity of putrid miasmata. The problem is, however, more arduous, that if the plague be contagious, and not like the small-pox, to be had only once in a life, how, in a country where no care is taken to check the extension, population has not long since become extinct?

"In Cairo, last year, forty thousand people were supposed to be infected with the plague, and many of the French garrison died in that city, although the disease was treated in their hospitals with the greatest ability.* In Upper Egypt sixty thousand of the inhabitants perished during the same season. There whole villages were swept away, and remained abandoned when the Indian army descended the Nile; but, at the same time, many instances occurred, when the nearest villages had not in them an instance of the malady. Then, if the plague had been positively contagious, how comes it that this prodigious violence of infection did not extend the disorder indiscriminately and universally amongst all the people in Egypt, producing, of course, effects considerably more fatal? Nor can the observation attached to the return of Dr. Young, under whose superintendance the English hospitals were preserved in the highest order of excellent arrangement, the sick treated with the greatest consideration, and whose philosophical mind so well capacitated him for the very important situation in which he was placed, controvert the position that the plague is not more contagious than other fevers. The servants attached to an hospital, by continuing constantly in tainted atmosphere, must certainly be subject to maladies produced by bad air; and those instances afford rather proof in favour of a doctrine very important to humanity and the military service.

"Egypt, in the possession of a power who felt interested in her prosperity, might, in a course of years, calculate on this disorder being altogether annihilated, or the per-

* "The justly celebrated Desgenettes was chief physician to the French army. The inspection of his hospitals obtained universal admiration, particularly the great one at Cairo.

nicious influence so corrected as no longer to possess the same calamitous properties. The introduction of lime, the use of coals, the paving of the streets in the cities, the formation of roads, the white-washing of the apartments in every house, the draining of all stagnant waters, and the use of well burnt brick instead of mud in building the villages, might, in time, correct the corrupted exhalations of the soil; whilst an attention to cleanliness would promote considerably the operations of science.

"Until that too remote period arrives, the abilities of medical men have discovered medicines which check the fatality, if they cannot ensure always a certain cure. The embrocation of oils is found to be very beneficial; and mercury, if the disorder has not gained already so much progress as to prevent the patient feeling, in time, the effects of that medicine, will generally produce the most favourable effects."

COLLECTION AND HISTORY OF THE TESTACEOUS ANIMALS FOUND IN THE WATERS OF NEW-YORK.

This department of our natural history has hitherto been almost wholly neglected. Some of the most eatable of our shell-fish are, indeed, well-known; but nobody has ever attempted until now to make a collection or catalogue of their testaceous coverings. The conchology of New-York has been attended to more carefully by Mr. Samuel Akerly than by any other person; and he has made great progress in collecting and arranging their species. He has communicated to Dr. Mitchill that he has already in his cabinet, of the MULTIVALVE shells, two species of *Pholas*, one of which is the common barnacle of our rocks, and the other brought from southern latitudes on the bottoms of ships. Of the BIVALVE shells he has twenty-two species; viz. of the *Mya*, or *Pisser*, three sorts; of the *Solen*, or *Razor*, two sorts; of the *Cardium*, or *Cockle*, two sorts; of the *Donax*, one sort, found in the beach where the Atlantic surf runs; of the *Venus*, or eatable *Clam*, one sort; of the *Arca*, or hairy *Clam*, three sorts; of the *Tellina*, one species; of the *Ostrea*, or *Oyster*, one species; of the *Pecten*, or *Scollop*, one species; of the *Anomia*, or *Golden Shell*, four or five varieties of one species; of the *Mytilus*, or *Mussel*, six species. Nor are the UNIVALVE shells less numerous; for the specimens in Mr. Akerly's collection are as follow; viz. of the *Cypræa*, or *Cowrie*, one species; of the *Voluta*, or *Volute*, two varieties of one species; of the *Buccinum*, or *Whelk*, three species;

of the *Murex*, or *Periwinkle*, four species; of the *Turbo*, or *Wreath*, three species; of the *Helix*, or *Snail*, three species; of the *Patella*, or *Limpet*, one species; of the *Serpula*, or *Pipe-worm*, two species; of the *Sabella*, or *Sand-tube*, one species; and of the *Teredo*, or *Ship-worm*, one species; amounting to twenty sorts. Hence it appears that the shells already discovered on the shores and in the rivers of New-York, amount to forty-four species, which may be thus recapitulated.

Multivalves, two species;
Bivalves, twenty-two; and
Univalves, twenty.

Of those herein enumerated, all but six are found in the salt water on the shores of Long-Island; the principal of them at Plandome. Mr. Akerly is still engaged in these inquiries, and making additions to his collection.

CURIOUS MINERALOGICAL APPEARANCES IN THE CITY OF WASHINGTON.

This seat of the General Government of the United States is situated in latitude 38 deg. 53 min. N. seventeen miles below the great falls of the Potowmack, where the locks have been constructed, and about five or six lower than the little falls above Georgetown. It is just at the head of tide-water, which rises and falls from four to five feet in the Eastern Branch and in the Tiber. Along the shore, from the mouth of Rock-Creek to the Tiber, the land adjoining the Potowmack is of considerable elevation. From the Tiber to the point at which the junction takes place with the Eastern Branch, the shore is more flat and low. In this part the land slopes with a gradual descent as you leave the Potowmack, until it ends in a wet and swampy tract, near where the great canal has been begun. This tract of low land and morass is between one and two miles in width. From this plain on the south, and from the bank of the Tiber on the west, rises, by a steep ascent, the noble hill on which the Capitol, or Congress-House, has been erected. The height of this hill is more than eighty feet above the level of the tide-water, and about sixty or seventy above the level of the adjacent and low ground. In all probability, this high ground formerly extended much nearer to the channel where now the Potowmack runs; and it is equally probable that, in distant ages, the bed of that stream was not near so deep as it is at present, nor capable of containing so much water. Consequently, in the remote ages alluded to, all the low land between the Capitol hill and the Potowmack,

including the shores of Goose-Creek, and the tract along Pennsylvania avenue, towards the elevation on which the President's house stands, may be considered as having been covered by water, and brought by the action of that fluid to its present form. Gradually, however, as the channel deepened, the water withdrew to its bed, narrowed its course, and left the intervening surface bare.

As a proof of this, it is observed that all the strata of earth hereabout are horizontal, and all the stones and pebbles they consist of are rounded, and appear to be water-worn. This is the case every where on the Eastern Branch, the Potowmack, and the parts of the city which have been dug away for the purpose of making streets, avenues, and buildings.

But what is most remarkable is, that even the base of the Capitol hill is underlaid with a stratum of muddy clay, in which wood and parts of trees have been discovered. During the summer of 1803 a well was dug in New-Jersey avenue, to the depth of near fifty feet. After passing through about thirty feet of gravel and sand, and then through about eighteen of dusty and fine argillaceous mud, trunks and branches of trees were found lying plentifully below. Many pieces of these were broken and hoisted up.

Their vegetable organization is very evident; and their clefts and crevices are filled up with veins of pyrites. The wood, as commonly happens when mixed or impregnated with pyrites, is turned to a blackish colour, somewhat resembling coal. But this carbonated state of the wood being evidently caused by sulphuric acid formed from the decaying pyrites, and the sulphur, as far as it is already saturated with oxygen, being no longer inflammable, this mineralized wood burns very slowly, and is wholly unfit for fuel.

Thus, among the curiosities of the high and commanding site of the Capitol, may be reckoned the existence and discovery of fossil and mineralized wood almost fifty feet below its present surface.

Near the twenty buildings, and within the square on which the new church is erecting, a piece of wood was brought up from the bottom of a well forty-five feet deep. This spot is half a mile distant from the former. The wood is in its entire state, and neither petrified nor mineralized. It is perfectly sound and well seasoned; and on cutting it there appears to be no doubt that it is black-walnut.

REMARKABLE FACTS TOUCHING THE GEOLOGY OF THE ATLANTIC TERRITORY OF VIRGINIA.

The following facts are related as authentic beyond any kind of doubt.—During the spring of 1802, a gentleman in the neighbourhood of Williamsburg, in digging a ditch on his farm, discovered, about four or five feet below the surface of the earth, a considerable portion of the skeleton of a whale. Fragments of the ribs and other parts of the body were found; and all the vertebræ regularly arranged, and very little impaired as to their figure. The spot on which this skeleton was found lies about two miles from the nearest shore of James' River, and fifty or sixty from the Atlantic Ocean. The whole of the circumstances led strongly to the belief that this animal had died in his native element, and had afterwards been buried in the sand at its bottom.

In Richmond, glossopetræ, or teeth of sharks, have been found, several times, in digging wells, at the depths of sixty, ninety, and an hundred feet below the surface of the earth.

As far west as the Blue-Ridge, marine shells and other exuviæ of the ocean are found, which show that that region was one day immerged in the deep.

On the shores of York River the bones of whales abound; and Mr. W. writes that he has been not a little amused in walking the sand-beach of that River, during the recess of the tide, and looking up at the high cliff or bank above him, to observe strata of sea-shells not yet decomposed, of the same kind as those which lay on the beach under his feet, interposed with strata of earth (the joint result, no doubt, of sand and putrid vegetables), exhibiting at once a sample of the manner in which the adjacent soil had been formed, and proof of the comparatively recent desertion of the waters.—*British Spy*, Lett. II.

BAHAMA AGRICULTURAL SOCIETY.

The government of the Bahamas has granted to their Agricultural Society one hundred acres of land, near the town of Nassau, in New-Providence. On this a Botanical Garden is about to be established, and a convenient house to be erected, to accommodate the members at their meetings. The society has proposed a number of premiums for the promotion of Agriculture in the Bahama Islands. We insert these as they were communicated to Dr. Mitchill, in December, 1803, by N. Hall, Esq. and while we applaud their liberal and patriotic

spirit, we look around and see but few similar establishments in the Fredish territories, or, indeed, any where on the continent.

" *Premiums proposed by the Bahama Agricultural Society for the Encouragement of Agriculture in the Bahama Islands.*

" 1. For the greatest number of Coffee plants, not fewer than ten thousand, at least two feet high, established on any one plantation in the Bahama Islands since the 13th day of March, 1801, £100.

" For the second greatest number, £50.

" For the third greatest number, £25.

" 2. For the best field or fields of Sugar-canes, not less than fifty acres, on any one plantation established in the said Islands since the 13th of March, 1801, which shall be cut after the first day of January, 1804, a gold medal.

" 3. For the best properly enclosed field of the Cactus Cochinilifer, established since the 13th of March, 1801, containing not less than three thousand plants, two feet high, a gold medal.

" 4. For the best field or fields of Barbadoes or Socotorine Aloes, established since the 13th of March, 1801, containing not less than twenty thousand plants, £100.

" For the second best, £ 50.

" For the third best, £ 25.

" 5. To the planter upon the Bahama Islands who shall make the largest quantity of Indian or Guinea Corn, from any quantity of land, containing not less than forty, nor more than sixty acres, in the crop of 1803 and 1804, a gold medal, or £ 50.

" 6. To the planter upon each of the Bahamas who shall make the largest quantity of good Cotton, from any quantity of land, containing not less than forty, nor more than sixty acres, in the crop of 1803 and 1804, a gold medal, or £50.

" 7. To the planter upon any of the Bahama Islands who shall raise the greatest quantity of Potatoes, from any quantity of land, containing not less than eight, nor more than twelve acres, in the crop of 1803 and 1804, £ 50.

" 8. To the planter upon any one of the Bahama Islands who shall make the largest quantity of Yams, from any number of acres, not exceeding twelve, nor less than eight, in the crop of 1803 and 1804, £ 50.

" 9. To the proprietor of any plantation or farm, on any

of the Bahama Islands, who, upon the first day of January, 1806, shall have the greatest number of Oranges, Shaddocks, Forbidden Fruit, Margoes, Mangustines, bearing fruit, and other fruit trees (Papaws excepted), not being fewer, in the whole, than one thousand five hundred, a gold medal.

"10. For the first score of Oxen, not less than three years old, raised by any one planter or farmer, on any of the Bahama Islands, and which shall be brought to the market of Nassau after the first day of January, 1806, a gold medal, or £50.

"11. For the first hundred full grown Wethers, raised by any one planter or farmer, on any one of the Bahama Islands, and which shall be brought to the market of Nassau after the first day of January, 1805, a gold medal, or £50.

"Every claimant of the above premiums shall produce a certificate from some creditable resident planters, testifying their knowledge of the facts stated in the claim."

CAOUTCHOUC FOUND IN CERTAIN MILKY PLANTS NEAR PHILADELPHIA.

We are obliged to Dr. Woodhouse, Professor of Chemistry in the University of Pennsylvania, for the following important article of intelligence.

"During the summer season I made a variety of experiments upon the milky plants of this country, and find that many of them, as Apocynum Cannabinum or Indian Hemp, Sonchus Floridanus or Sow-thistle, Asclepias Syriaca or Syrian Swallow-wort, Euphorbia Picta or Painted Spurge, and a few others, yield a product which possesses nearly the same properties as the Caoutchouc of South-America.

"The milk in these vegetables answers the same purpose as the blood in animals, and may very properly be called the white blood of plants. When this kind of milk is received in a vessel exposed to the air, it separates, like the blood of animals, into two parts, serum and crassamentum. If it is exposed in contact with the air of the atmosphere, confined by water, the oxygenous portion of this air unites with the coal of the crassamentum, and forms carbonic acid gas, by which means the purity of this air is greatly diminished.

"When a wound, ever so minute, is made in one of these milky vegetables, it immediately begins to bleed, and death would ensue, did not a coagulum quickly form round the abraded part. We find the same circumstance take place in animals who have been wounded.

"The natives of South-America make torches of the Caoutchouc; and the coagulum of our native milky plants is equally as inflammable as the gum-elastic, and burns exactly in the same manner, giving a vivid light, and throwing off a considerable quantity of lamp-black, or the charcoal of oils.

"When the white juice of the Apocynum Cannabinum is received in a cup, it immediately coagulates; the coagulum may be drawn thirty times its length, and it will instantly contract again to its original size.

"The Caoutchouc, and the coagulum of our lactiferous vegetables, exposed in a glass tube to a red heat, yield a portion of the oil of turpentine, and large quantities of carbonated hydrogenous gas, which has a very disagreeable smell."

MANUFACTURE OF ARTIFICIAL MINERAL WATERS.

This manufacture has been undertaken in New-York by V. A. Servant Granger, D. M. M. More than two years ago these artificial mineral waters were began to be prepared at Geneva, Paris, and London, and with the desired success. They are thus easily brought within the reach of persons who are unable to travel, and who stand in need of efficacious means to mitigate or cure chronic diseases, which resist ordinary remedies, such as calculus, scrophula, rheumatism, and various affections of the liver, the uterus, and the lungs.

These establishments have been favoured with the decided approbation of learned societies, and the most eminent chemists and physicians. In Paris, particularly, the National Institute, the Medical Society, and the most distinguished chemists, have expressed their opinions on the subject in strong terms, and have sought, by every means, to attach the respect and confidence of the public.

Dr. Servant has lately formed a similar establishment at New-York. By the assistance of simple, and, at the same time, powerful machinery, he is able to impregnate water with the gases in every practicable degree, from the smallest proportion up to five times its volume. He has succeeded so far in the attempt, that the water is introduced into the apparatus, there mixed with the necessary ingredients, then withdrawn either wholly or in part, and always with the important advantage of an exclusion of air, light, and atmospheric temperature; while, on the other hand, every thing is so arranged that the water is made to undergo all the combinations, and all the different degrees of heat requisite to complete the several operations.

The chemical processes in this manufacture are executed with accuracy, and on the most approved principles. Chalybeate waters present a difficulty in combining the proper proportion of iron with the other different component parts. But Dr. Servant thinks he can produce them from his apparatus in a state quite equal to that in which they are presented by nature. He thinks, indeed, that he can impart the chalybeate impregnation in a higher degree than what is found in the natural waters, and even in those of *Spa*, which exhibit, together with the combination of iron, a neutral salt and carbonate of soda in an uncombined state. All this is accomplished without diminishing the limpidness of the water.

Physicians every day find the necessity of employing, for the relief of female complaints, some active preparation of iron, which may be taken easily, and for a sufficient length of time. In the preparation of the alkaline chalybeate waters, and of the alkaline gaseous waters, the efforts of art have gone beyond the state in which they are presented by nature.

Dr. Servant has exhibited his apparatus and his processes to several respectable physicians in New-York, who have given them their decided approbation.

The establishment is formed at Mount-Vernon Garden, where invalids may find the advantages of good air and exercise, in connection with the use of the waters.

BARON CARENDEFFEZ ON GALVANISM.

An interesting memoir on Galvanic Electricity, by Baron Carendeffez, has been lately received, and will be inserted in our next number. In this memoir many interesting experiments and opinions will be found concerning the electrats, hydrurets, and metallic atmospheres of different metals. As the metals are so powerfully acted upon by Galvanic electricity, and thereby reduced to a condition to be readily received into the animal system, the Baron supposes that the pile of Volta may be very usefully employed for the purpose of volatilizing and introducing into the human body such of the metals as are deemed the most salutary; but, at the same time, he condemns the use of copper and other deleterious metals in the construction of piles for medical purposes. He thinks that, by a proper use of auxiliary chemical agents, metallic plates, of the diameter of a dollar, may be made to produce all the requisite force of effect.

WITTMAN'S TRAVELS.

Some additional light is thrown on the nature of the Plague of the Levant, by Dr. Wittman's elegant book of "*Travels in Turkey, Asia Minor, Syria, and across the Desert, into Egypt, during the Years* 1799, 1800, *and* 1801, *in Company with the Turkish Army, and the British Military Mission;*" which has lately come into our hands. This medical traveller seems to consider the Plague as merely the highest grade of the various and multiform diseases, whose inferior degrees are known under the title of Remittent Fevers. Among the attributes of the Plague he mentions a great number of circumstances which equally belong to our Yellow Fever. The discriminating points of character, in all probability, depend chiefly upon climate, state of society, modes of living, &c. And, upon the whole, it seems clearly to result, that the two pestilential scourges which so often lay waste the oriental and occidental regions, are in each only the maximum of febrile malignity produced by the operation of the miasmata which heat exhales from putrefying animal and vegetable substances. A further and more detailed account of the medical part of this work may be hereafter expected.

NEW JOURNAL OF MEDICINE, SURGERY AND NATURAL HISTORY.

By Mons. TRABUC, Surgeon-General of the French army in St. Domingo, Dr. MILLER has been politely favoured with four numbers of a monthly publication, entitled, "*Journal Des Officiers De Santè de St. Domingue,*" conducted by M. TRABUC, Surgeon-General; FONTANGE, Physician-General; BALLY, Adjunct-Physician; and BOUVIER, Apothecary-General of that army. This work was designed to comprize Memoirs on Medicine, Surgery and Natural History, and to encourage, by every liberal incentive, further inquiries into the diseases and natural productions of that island. It is executed in a manner which reflects great honour on the talents, learning, and zeal of the several gentlemen who embarked in the design.

This is the first publication, relative to the Diseases and Natural History of St. Domingo, undertaken in that island, since the volume of Memoirs by the *Philadelphian Society* at Cape-François, which was published in 1788. It was a subject of regret, that the calamities of revolution and war so soon arrested the labours of that enterprizing association; and it is not less to be lamented now, that the learned Editors of this Jour-

ral are compelled, by similar disasters, to relinquish an enterprize which they began under such fair and flattering auspices.

REPLY OF DR. WILLIAM PATTERSON.

Our readers will recollect some Remarks on the opinions of Dr. William Patterson, of Londonderry, and Dr. William Drennan, of Dublin, in our vol. iv. p. 83, of the first Hexade. To these Remarks, Dr. Patterson soon afterwards transmitted a Reply, which, to our sincere regret, never came to our hands. We have lately received from that learned and ingenious correspondent, another copy of one paragraph of his Reply, which we now insert with great pleasure.

"That a raging distemper should baffle American skill, certainly is an incident far from being unusual in medical life, and is confirmed by too many instances. But, with respect to the aid, which the exertions of the London police are thought to have received from the skill of Sydenham, during the plague of 1665, there is authority for affirming, that it was, in fact, *nothing;* for the British Hippocrates, according to the records of that calamitous season, *fled*—he fled from the field of battle, where, probably, his powerful arm might have rescued many of his countrymen, his friends, his fellow-citizens, and his fellow creatures from the mortal weapons of an unrelenting foe! Not only did Sydenham flee, but many others of the faculty became, in like manner, deserters; and, from the history of that trying juncture, it appears that Dr. Nicholas Hodges was almost the only physician who staid in the city, and offered the helps of his art against the spreading pestilence; yet, after this remarkable effort of virtue, that very man was kept a prisoner in Ludgate, for debt, till he died. This fate needs no comment. Who will not deplore it? Who will not feel indignant at the obdurate and ungrateful hearts of that day! In what degree the 'splendid improvement of medical science in Great-Britain,' may be depreciated at present by the mortal prevalence of a putrid sore-throat in some parts of England, is not a point for enlarging on in this reply."

PRIZE QUESTIONS.

The following prize subjects are proposed by the *Maryland Society for Promoting Useful Knowledge:*

1st. The history of the State of Maryland.

2d. The best mode of punishing criminals.

A gold medal, with an appropriate motto and relief, will be adjudged to each of the best productions on those subjects, received previous to the first of January, 1805.

Candidates for the above prizes will be pleased to direct their papers to Dr. John Owen, Secretary of the Society, at Baltimore, and annex to them a sealed note, containing the author's name and residence, under cover of directions for their disposal, in case they fail to obtain a prize.

MEDICAL GRADUATION IN COLUMBIA COLLEGE.

On the eighth of November, 1803, the following gentlemen were admitted to the degree of Doctor of Medicine in Columbia College, after publishing and defending their respective inaugural dissertations on the subjects annexed to their names; viz.

ISAAC FORSTER, on Dysentery.
SAMUEL SCOFIELD, on Vaccina.
JAMES R. MANLEY, on Yellow Fever.

OFFICERS OF THE AMERICAN PHILOSOPHICL SOCIETY.

The American Philosophical Society met on Friday, the 6th of January, 1804, for the election of officers for the ensuing year, when the following gentlemen were duly chosen.

Thomas Jefferson, *President.*
Robert Patterson, Caspar Wistar, Benjamin Smith Barton, } *Vice-Presidents.*
John Redman Coxe, Adam Seybert, Thomas C. James, Thomas T. Hewson, } *Secretaries.*
William White, Jonathan B. Smith, Peter S. Duponceau, Adam Kuhn, } *Counsellors for three Years.*
Charles W. Peale, Robert Hare, jun. John Church, } *Curators.*
John Vaughan, *Treasurer.*

FOREIGN.

NEW METHOD OF TREATING GONORRHOEA.

THE nature and seat of Gonorrhœa are well understood, but the treatment employed by different practitioners varies in so many essential points, as still to afford ample opportunity for observation and improvement. Every raw druggist's apprentice boy now takes upon him to prescribe some favourite pill or injection, and the frequency of the complaint affords abundance of patients in every rank and situation of life. The mischief produced by this practice is of no small extent; many serious derangements of these complicated organs may be traced to improper treatment of gonorrhœa; and among these, stricture in the urethra may be reckoned as one of the most important.

Mr. C. H. Wilkinson proposes an improvement in the treatment of this disease, which he recommends in the following words:

"By far the greater number of strictures originates from gonorrhœa; when we minutely inquire into every circumstance relative to an urinary obstruction, we can almost always trace its source to this cause.

"Mr. Home, in his valuable observations on strictures, thus observes: 'From the idea that injections do sometimes produce stricture, and that we are unable before hand, to determine in what cases they may be used with impunity, I have been induced entirely to forego their use, in the treatment of gonorrhœa, rather than incur a risk, however small it may be, of producing so seriously distressing a complaint.

"Injections are objectionable, not from any retropulsive motion as to the venereal virus, but from the state they induce in the lining membrane of the urethra, or lay the foundation to so many painful urinary obstructions.

"To obviate such distressing consequences, I have, for many years, been in the habit of employing bougies, which, I suppose, act in the following manner:

"A bougie, when formed of mild materials, applied to a tender surface, acts as an unguentous application to all the parts of the canal at the same time; the urethra, thus preserved in an equal, uniform, and gradual state of distention, the formation of folds is thus entirely prevented.

"The bougie should be well covered with oil, and when

the inflammation is very violent, I have experienced considerable advantage from smearing a bougie with a strong solution of opium in oil.

"It might appear, that in a very inflamed state of the urethra, there would be too much irritation to admit, without excessive pain, the introduction of such a solid substance as a bougie.

"In such cases, I previously inject a small portion of oil; the bougie may then be passed with very little uneasiness; when once introduced the inflammation is more rapidly removed than by any other mode I know of.

"In the day-time I always employ an injection of a weak solution of the acetite of lead, and introduce the bougie on the evening, or at bed-time.

"The first night a bougie may not be retained more than two hours; on the second night, it is generally easily retained the whole night.

"In a recently contracted gonorrhœa, I have rarely found it necessary to introduce more than five or six bougies.

"As the seat of the disease is generally anterior to the bulb of the urethra, a bougie of six inches in length might be deemed sufficient: I have always observed, that a short bougie is more troublesome to the patient than one of ten inches; it is easier for the point of the bougie to lie in the cavity of the bladder, than to terminate in the canal.

"The bougie should be formed of the mildest materials, and of an intermediate consistency; if too hard, the canal is unnecessarily irritated; if too soft, it is apt to bend in its introduction, and irritate from its irregularity.

"These ten years I have constantly adopted this practice; no one of my patients has hitherto experienced the least urinary obstruction: In many of them, in consequence of being thus treated, I have discovered strictures in an incipient state, originating from a former gonorrhœa: the method here proposed for their prevention is also the best for their removal."

[*Aikin's Annual Review.*

REMEDY FOR THE STING OF WASPS AND BEES.

It has been found, by experience, that the best remedy for the sting of wasps and bees, is to apply to the part affected common culinary salt moistened with a little water. Even in a case where the patient had incautiously swallowed a wasp in a draught of beer, and been stung by it in the wind-pipe, the alarming symptoms that ensued were almost instantly relieved by swallowing repeated doses of water, saturated with salt. [*Lond. Month. Mag.*

METHOD OF PREPARING SULPHATE OF SODA.

A new method of preparing sulphate of soda from sulphate of lime, consists in making into a paste, with a sufficient quantity of water, eight parts of burned gypsum, or sulphate of lime, five of clay, and five of common salt. This mixture is burned in a kiln, and then ground to powder, diffused in a sufficient quantity of water, which, after being strained and evaporated, is suffered to crystallize. [*Ibid.*

METHOD OF PREPARING PHOSPHATE OF SODA.

M. Funcke has discovered a new method of preparing phosphate of soda, in an economical, expeditious, and easy manner. His process consists in saturating the excess of lime contained in calcined bones, with diluted sulphuric acid, and then dissolving the remaining phosphate of lime in nitric acid. To this solution he adds a like quantity of sulphate of soda, and then recovers the nitric acid by distillation. The phosphate of soda is then separated from the lime, by the affusion of water, and crystallization in the usual manner. [*Ibid.*

MEDICAL BIOGRAPHY.

Biographical Memoir *of the Hon.* Joshua Brackett, *Esq. M. D. By the Rev.* Timothy Alden, *jun.*

THE subject of this memoir was born at Greenland, in the vicinity of Portsmouth, New-Hampshire, in May, 1733. Having gone through the preparatory studies, under the tuition of the Rev. Henry Rust, at Stratham, he became an alumnus of Harvard College in 1748, the usual honours of which he received in 1752 and 1755.

His collegiate course being finished, he attended to the science of theology. In contemplating this for a profession, he consulted the pleasure of his parents more than the natural turn of his mind. Having commenced a preacher, the state of his health was presently such as obliged him to determine on some other pursuit. He then devoted himself to the study of a profession which was ever more congenial with his inclination, and in which Providence seemed to have fitted him for greater eminence. He studied the medical art under the direction Dr. Clement Jackson, long since deceased, in Ports-

mouth, where he became and continued a practitioner till his death.

In early life he married Miss Hannah Whipple, sister of the late Gen. Whipple, and of the present Collector of this port, who lives to mourn the kindest of husbands.

On the 30th of October, 1783, he was chosen an honorary member of the Massachusetts Medical Society. He was one of the nineteen who first formed a similar institution in the State of New-Hampshire, for which an act of incorporation was obtained in 1791. In the year 1792 he was complimented, at his *alma mater*, with a medical doctorate. On the 19th of June, 1793, he succeeded his excellency, the late Hon. Josiah Bartlett, Esq. M. D. in the presidency of the New-Hampshire Medical Society, and, by repeated elections, continued in this office till the 15th of May, 1799, when, in consequence of his declining state of health, he resigned it. He had previously presented the society with one hundred and forty-three volumes of valuable books, as the foundation of a medical library. On retiring from the presidency, he received an address, which handsomely expressed the respectful acknowledgments of this society for his diligent and friendly attention to its interests, and his liberal donation to it.

Dr. Brackett had interested himself on the subject of a Professorship for Natural History and Botany at the University in Cambridge. He told the writer of this memoir, not many weeks before his death, that it was a subject which had much engrossed his mind for thirty years. Before his decease, a plan had been adopted for carrying so useful an establishment into effect, and donations for that purpose, to the amount of several thousand dollars, had been subscribed. It is pleasing to add, he left the request with his surviving consort, that a certain property, of the value of fifteen hundred dollars, when she should have done with it, might be conveyed to the Corporation of Harvard College for the afore-mentioned important design. The author of this communication is happy to state, that Mrs. Brackett says, to adopt her affectionate and respectful language, that "she shall hold his every wish on the subject sacred as a word from Heaven."

Dr. Brackett was much distinguished for his activity and zeal in the cause of American independence. He was one of the Committee of Safety during the revolutionary war. At an early period of it he was appointed Judge of the Court Maritime in New-Hampshire, and sustained that office with re-

putation till the necessity of it was precluded by the establishment of the District Courts.

His profession, however, in which he shone with eminence, was his peculiar delight, as the native bias of his soul led him to the relief of those wants and distresses which it continually presented to his view. To increase his knowledge and usefulness in it, his reading, which was uncommonly extensive, his observations, which were accurate, and his reflections, which were judicious, were principally directed.

He was extremely attentive to his patients, and spared no pains to investigate the cause and the nature of their malady, and to afford relief. *In arte obstetrica valde peritus fuit, nulla fæmina, sub ejus cura, labore parturiendi, unquam moriente.* While a happy success attended his professional ministrations, his tenderness and sympathy with the sons and daughters of disease and distress were striking traits in his character, and have greatly endeared his memory.

The Doctor occasionally made minutes of important cases which came under his care, and of the measures pursued; but as these were merely for his own use, few of them have been found in a finished state.

He also kept, for twenty-five years before his death, a thermometrical and meteorological registry, which would be a valuable acquisition to the cabinet of some literary society.

He was mild in his temper, of an affable turn, amiable in his disposition, unassuming in his deportment, and was sincerely beloved and highly respected in the social walks of life.

He was a man of staunch integrity, sincere friendship, and great benevolence. He was an enemy to flattery, and no one was less ambitious of popular applause.

Humanity was a most distinguished trait in his character. It ought to be recorded that, in his professional labours, he was peculiarly kind to the poor, and never made a charge where he had reason to think the payment would occasion the smallest embarrassment. This was a conduct not unworthy of the Man of Ross.

For a considerable time before his death, he found that his constitution was under a gradual and general decay, through a disease in the region of the heart, as to the nature of which he could never be fully satisfied. At length he determined to try the efficacy of the Saratoga waters, for which purpose he set out from Portsmouth on the 23d of June, 1802. Having arrived at the springs, he continued there but

a few days; for he found that his disorder must bring him to the grave; and, feeling a consciousness that the time of his departure was at hand, he hastened his return, that he might be among his friends before the closing scene. He reached home on Friday, the 9th of July, visited several patients, and continued to walk out till the Tuesday following. From that time he was confined to his house till his death, which took place on Saturday, the 17th of July, at two in the morning. On the ensuing Monday the remains of this lamented philanthropist and physician were interred with great respect, and the tears of the widow and the orphan watered his grave.

On the monument erected to the memory of Dr. Brackett is the following inscription, which was prepared by another hand.

Here rest the remains
of
Dr. JOSHUA BRACKETT,
Late President
Of the *New-Hampshire Medical Society;*
Who, in full belief of the restoration of all things,
Calmly resigned his breath,
17th July, A. D. 1802,
In the 69th year of his age.
Appointed by the State of New-Hampshire
Judge of the Maritime Court
At the time she assumed her sovereign rights,
He sustained the office with honour and integrity,
Until the adoption of the Federal Compact.
He was in judgment sound,
In friendship firm,
In sentiment liberal,
And in benevolence unbounded.

Nov. 22, 1803.

APPENDIX.

Measures taken by the Government of the United States to lessen the Rigours of Quarantine in Foreign Ports, and thereby to avoid, in some degree, the Inconveniences of a suspended Commerce.

No. 1.

IN the beginning of August, 1801, Mr. Madison, Secretary of State, addressed the following directions on the subject of quarantine, in a circular letter, to the Consuls and Commercial Agents of the United States residing in foreign parts.

" In many of the ports of Europe our vessels have been subjected to a ruinous and oppressive quarantine. It has generally been imposed without much attention to the state of health in the port of the vessel's departure in the United States. Thus, whilst the port of Charleston, South-Carolina, may be unhealthy, a vessel arriving from Boston, where good health may prevail, is subjected to an indiscriminating quarantine. In the winter months, also, it is considered impossible that a vessel can carry from this country any dangerously infectious disorder; the epidemics which have, within these eight years past, been so fatal in some of our sea-ports, breaking out about midsummer, and totally disappearing with the setting in of the frost in November.

" We are encouraged to expect, that by sending with our vessels authentic certificates of health, granted by the most respectable municipal officers of our ports, under a vigilant precaution, and with a scrupulous regard to truth, we shall experience a relaxation of this burthensome imposition. Accordingly, the Secretary of the Treasury has given directions to the Collectors of the Customs to carry this plan into effect. Certificates of health will therefore be occasionally sent to the Consuls in Europe, who, after communicating them to the officer or board in the place of their residence, charged with the superintendence of health, will transmit copies, or, if needful, the original, to the American Minister, if any such is established in the country.

" Enclosed are copies of the circular letter addressed to the Collectors of the Customs, on this occasion, by the Secretary of the Treasury, and of the form of a certificate of health. It is proper for me here to mention to you, that there are but

thirteen ports, viz. Portsmouth, (N. H.) Newbury-port, Salem, Boston, New-port, Providence, New-York, Philadelphia, Baltimore, Norfolk, Wilmington, (N. C.) Charleston, (S. C.) and Savannah, in which Naval-officers are established by law; and that in all other ports the bill of health can only be certified by the Collector; a circumstance with which perhaps foreign agents, to whom the circular may be communicated, should be acquainted, in order to prevent any injury abroad to vessels sailing from these ports, on account of the unavoidable omission of a Naval-officer's signature.

" Whilst we are led to expect a benefit from this arrangement, we think it will not be confined to ourselves. When real danger exists, other nations will be timely and candidly alarmed; and when there is none, they as well as we will be absolved from the disadvantages of a suspended intercourse.

" As it becomes us as well as others to guard against contagion, I have to request you, and more especially those who reside in the West-Indies, and on the Mediterranean, to report to this department, as often as it may be necessary, the most speedy information of the prevalence of epidemics in the ports of your districts. As soon as they have subsided, you will give information of it."

No. 2.

The circular letter from Mr. Gallatin, Secretary of the Treasury, to the Collectors of the Customs, was prepared in July, 1801, and intended to be sent abroad for the sake of informing foreign residents of the arrangements made at home.

" Sir,

" The quarantine laws of some European nations have proven so oppressive to our commerce, that it has become necessary to adopt every measure which may induce a reasonable relaxation.

" In order to produce that desirable effect, it seems requisite to impress a conviction, that the most strict adherence to truth always characterizes the certificates of health which may be granted to our ships; and to attach to those certificates the forms which are most usual in other countries, and such attestations as may give them the highest degree of authenticity.

" It cannot be too strongly impressed, that no temporary cause should, at any time, induce a concealment of any circumstance whatever, however unpleasant an acknowledgment of any contagious disease may be to the officer obliged to cer-

tify it. Nor should any speculative opinion, however plausible, or perhaps well founded, be indulged on the question of what is or is not a contagious disease; but, bills of health being operative only abroad, those diseases which, in other countries, have heretofore usually been considered as contagious, should be stated in the bill, whenever they do exist in the port or its vicinity.

"The annexed form of a bill of health, in which are specified the name of the vessel and captain, the number of persons composing the crew, and of passengers respectively, the species of merchandize of which the cargo does consist, and the destination of the vessel, and which applies also to the state of health of the port and of the adjoining country, seems, from information received, to be the most eligible; and it is recommended that the same should be uniformly adopted. If there is no prevailing sickness at the time of the vessel's sailing, the blank between the words *that* and *in* is to be filled up as follows: *No plague or other contagious or dangerous disease at present exists.* But if the contrary should be the case, the blank is then to be filled up in such way as to clearly and unequivocally express the nature of the existing disorder.

"The practice of other countries renders it desirable that bills of health, so far as they relate to the health of the port itself and its vicinity, should be attested by other authorities besides that of the Custom-House officers. Those which, it is believed, will inspire most confidence, are the Board of Health, or any similar institution, whenever such one does exist, and the municipal authority of the proper city, borough, or town: it is not doubted that these will co-operate with you in granting such certificates as may be requisite. You are, therefore, requested to confer with them, and to adopt, for the present, such forms as will appear most eligible.

"But, as uniformity in all the sea-ports, so far as the variety of state regulations will permit, is desirable, you will be pleased to report the result to this department, in order to enable me to propose hereafter such practicable alterations as a general view of the subject may suggest. In the mean while, it is, perhaps, superfluous to observe, that, in order to prevent any injury which might arise from the want of such attestation, it will be proper that the municipal authority should certify the non-existence of a Board of Health, whenever no such institution exists in the port, and that when they (the town or city officers or corporation) are, *ex officio*, health officers, they should also certify the same.

"Whenever it can be done, it will be useful to obtain a certificate of the facts, stated in the bill of health, by the consul, or agent of the country to which the vessel may be bound; and from a late public notification, this caution seems particularly necessary in respect to vessels destined for Spain. This attestation it will be the interest of the owners of vessels to procure. But in those ports where the distance from the place of residence of the proper consul may prevent its being obtained, you may, on application of the party, certify, that there is not within the district, county, or state, as the case may be, any consul or agent for that country to which the vessel is bound.

"As you must be sensible that there is no law by which to compel the masters of vessels to take certificates of health, the probability is, that in times of sickness they will refuse to receive them. In such case it becomes your duty to inform them that the regulation had been adopted solely for the benefit of commerce, and that their arrival in foreign parts without those certificates, will be regarded as presumptive evidence of the existence of infectious or contagious disorders in the ports from whence they cleared out.

"The President, by whose directions I have addressed you on this subject, entertains no doubt of your cheerfulness in carrying into effect regulations which may, in many instances, relieve our vessels from very injurious and useless detentions."

No. 3.

The American Bill of Health.

No. — Seal.

United States of America, District of ———.

To all to whom these presents shall come; we, the Collector and Naval-Officer of the port of ———, do, by the tenor of these presents, certify and make known, that the Captain, officers, seamen, and passengers of the —— called ———, laden with ———, and of which ——— is Captain, consisting of —— officers and seamen, and —— passengers, now ready to proceed on a voyage to ——, and elsewhere beyond sea, are all in good health. And we do further certify, that ——, in this port, or in its vicinity. Given under our hands, and the seal of the Custom-House, at ———, the —— day of ———, in the year of our Lord ——, and in the —— year of the independence of the said States.

Signed. ——, Collector. ——, N. Officer.

CORRESPONDENCE.

From Dr. Dancer, of Kingston, in the Island of Jamaica, the Editors have received the following animadversions on the review of his pamphlet entitled, "Strictures on Dr. Grant's Essay on Yellow Fever," *which the reader will find in our vol.* vi. *page* 414.

THE Editors of the Medical Repository having, in the notice they have taken of *Dr. Dancer's Strictures on Dr. Grant's Essay on Yellow Fever*, preferred against him a charge of *censoriousness* and *hypercriticism*, they are requested to admit the following vindicatory remarks.

T. Dancer having himself, as an author, had occasion to claim indulgence, might be supposed inclined to show it to others, in conformity to a very reasonable maxim—of doing to others as we would they should do unto us—

Nos veniam damus petimusque vicissim;

But it must be admitted that there are some faults that are not entitled to indulgence, and which it would be almost criminal to overlook. Who can excuse an author making a parade of Greek learning, whilst he shows himself ignorant of grammar, and incapable of constructing an intelligible sentence in English? Who can pardon a physician for being ignorant of all the improvements in his profession, and adhering to tenets that have been exploded almost a century ago? But should any one think it venial in a physician (who is generally considered as a scholar and a man of science) to promulgate stale errors in ungrammatical language, who can forgive the man that has *maligned* his brethren, accusing them of *murder!** because, seeing the ill-success of *his* practice, they had recourse to another, by which they thought they had a better chance of saving their patients. Dr. Grant having shown no mercy, deserves none; and if it should be thought that the criticisms of T. Dancer are severe, they must, nevertheless, be acknowledged just. His Strictures are not, as they have been termed, either *censorious* or *hypercritical;* and it is difficult to say what motives the reviewers could have had for endeavouring to palliate and extenuate the faults of a publication which they confessedly had never perused, nor were otherwise acquainted with than through the medium of the Strictures made on it. This only can account for their deeming the animadversions of T. Dancer harsh. They are not, however, more so than those made by others,† and even by the reviewers themselves, who, in recommending a correction of faults in a new edition, confess the existence of them in the present.

ANSWER.

In reply to these remarks, the Editors think it their duty to declare, that nothing was more remote from the mind of the writer of that article in the review, than to give Dr. Dancer any pain or offence. On the contrary, the respect felt for his talents and usefulness as a medical practitioner and writer, has been repeatedly stated in this work.

* "Dr. Grant has repeatedly declared, that the practice of giving mercury originated in folly, and was persisted in through obstinacy.

† "See English Reviews."

But as Dr. Dancer thinks proper to appeal from the judgment of the reviewer, and thereby to place the Editors and himself at the bar of the public, it becomes necessary to specify some of the grounds on which the offensive expressions were founded.

In the list of grammatical errors charged upon Dr. Grant, Dr. Dancer mentions the following: "Another abstraction from the work of negroes on estates IS SORES." That this sentence is very inelegant cannot be questioned; but it would not be quite so easy to maintain that the fault amounts to a violation of syntax. When a verb comes between two nouns, either of which may be understood as the subject of the affirmation (as in this case), it may agree with either of them. It is true that, in the application of this rule, some regard ought to be had to the noun which is more particularly the subject of such affirmation, and especially to that which stands next to the verb. But the disregard of this distinction is to be considered rather as a want of neatness than as a breach of concord.

Among Dr. Grant's supposed faults of language, Dr. Dancer enumerates the following: "This *native* propensity to indolence in negroes"—and proposes to substitute the word *natural* for *native*; but if there be any ground of criticism in this instance, it is extremely small.

Dr. Dancer condemns the following phrase: "Inhabitants *migrating* to the torrid zone"—and thinks that *emigrating* should have been used, under the impression that *migrating* is confined to express the removal of birds or other animals. But this is evidently a mistake; as the best writers speak of the *migration* of nations or of bodies of men, as well as of animals.

These particulars afford a specimen of some of the critical remarks in Dr. Dancer's "Strictures," which, together with an eagerness to point at trifling blunders with severity, led our reviewer to observe, that "*among many solid and valuable observations, there are not wanting traits in Dr. D.'s performance of censoriousness and hypercriticism.*"

☞ We are requested by Dr. John Redman Coxe, of Philadelphia, whose zeal in the improvement and extension of Vaccination is so well known, to apprize the public that the plate prefixed to his "*Practical Observations on Vaccination,*" from the use of an improper colouring material by the artist, has undergone a change of colour, which does not now so truly represent the appearances of the disease as in the original state.